The Effects of a Comprehensive Weight Management Program, Including Nutrition Education, Physical Activity, & Behavior Change Techniques on Weight Loss and Health-Related Behaviors

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THE EFFECTS OF A COMPREHENSIVE WEIGHT MANAGEMENT PROGRAM, INCUDING NUTRITION EDUCATION, PHYSICAL ACTIVITY, AND BEHAVIOR CHANGE TECHNIQUES ON WEIGHT LOSS AND HEALTH-RELATED BEHAVIORS

by

Christina Vergara Aleshire, RDN, LD

Bachelor’s Degree in Nutrition Science
University of Nevada, Las Vegas
2011

A thesis submitted in partial fulfillment of the requirements for the

Master of Science - Exercise Physiology

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School of Allied Health Sciences
Division of Health Sciences
The Graduate College

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May 2014
ABSTRACT

The Effects of a Comprehensive Weight Management Program, Including Nutrition Education, Physical Activity, & Behavior Change Techniques on Weight Loss and Health-Related Behaviors

by

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Laura J. Kruskall, PhD, RDN, CSSD, LD, Examination Committee Chair
Director, Nutrition Sciences
University of Nevada, Las Vegas

Obesity is a major risk factor for several chronic diseases including hypertension, type 2 diabetes, cardiovascular disease, postmenopausal breast cancer, colon cancer, pancreatic cancer and all-cause mortality due to the physiological and morphological stresses placed on the body (Britten, Cleveland, Koegel, Kuczynski, Nickols-Richardson, S. 2012; Wu, Gao, Chen, van Dam, 2009). The latest CDC survey reports the US population is at 35.8 percent overweight and 28.1 percent obese, with the State of Nevada following closely at 36.3 percent overweight and 26.2 percent obese. The condition of obesity is characterized by an overall excessive storage of adipose tissue and diseased metabolic milieu.

The Position of the American Dietetic Association: Weight Management (the Academy of Nutrition and Dietetics formerly the American Dietetic Association) supports the development and implementation of a comprehensive, multipronged approach, based on scientific evidence and guidelines to treat overweight and obese individuals. These treatments should be based on lifestyle and behavior modification strategies that will result in “prevention of weight gain or stopping weight gain in an
individual who has been seeing a steady increase in his or her weight; varying degrees of
improvements in physical and emotional health; small maintainable weight losses or
more extensive weight losses achieved through modified eating and exercise behaviors;
and improvements in eating, exercise and other behaviors” (American Dietetic
Association, 2009). Methods to reduce the trajectory of obesity at an individual as well as
on a population level are extremely important. Thus programs need to be individualized
so that they are effectively geared towards the population being served.

The purpose of this investigation was to establish and evaluate the benefits of a
weight management program, using the elements found in research to have the greatest
impact on health related outcomes, and how to best implement these findings into an
ongoing community outreach program.

Ten participants were assigned to one of two conditions: (a) nutrition and physical
activity education plus behavior modification techniques via group meetings; (b) nutrition
and physical activity education via emailed handouts. Primary dependent variables were
measured at baseline and post treatment; these included dietary and physical activity
behaviors, dietary intake, weight lost and inches lost. The intervention consisted of eight,
60-minute weekly meetings with nutrition education and behavior modification strategies
offered at each session. This same nutrition information was emailed to the participants in
the email group.

Conclusion: Overall there were no significant changes in weight, there was a
significant difference in inches lost about the waist and hip, and there was no significant
difference in millimeters lost about the triceps. There was a significant change in
behavior scores and there was a significant change in nutrition knowledge scores.
Post treatment, the behavior modification techniques participants indicated worked best in changing behavior were “retrain your brain- learn healthy ways to reward yourself,” “track your diet and physical activity” and “connect with people that share your goals.” The results of this pilot study could serve as the blueprint for future program design, implementation and research performed at the UNLV Nutrition Center.
ACKNOWLEDGEMENTS

I would like to thank my committee chair and mentor, Dr. Laura Kruskall for all her encouragement, guidance and wisdom. I was able to learn from her both as an undergraduate and as a graduate student. Dr. Kruskall took me under her wing and helped mold me into the individual I am today, for this I am forever grateful. I would also like to recognize my committee members, Dr. Jack Young and Dr. Richard Tandy for their guidance and continued support throughout my undergraduate and graduate program. I would not have been able to get through this journey without them. I would like to thank Dr. Brad Donohue for his participation in my committee as well as for all his thoughtful insight into my project. I would like to thank Molly Michelman for her constant inspiration and positive influence in my life. I would like to thank my amazing husband, David Aleshire for being so understanding and always believing in me. He gave me his unconditional support through this entire process. Most importantly I would like to give praise to God; that in all things God may be glorified through Jesus Christ, to whom belong the glory and dominion forever and ever.
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CHAPTER 1
INTRODUCTION

According to the Behavioral Risk Factor Surveillance System, the prevalence of overweight and obesity has shown a marked increase over the past two decades. “The Behavioral Risk Factor Surveillance System or BFRSS is a collaborative project of the Center for Disease Control and Prevention (CDC) and U.S. states and territories. [It] is an ongoing data collection program designed to measure behavioral risk factors for the adult population (18 years of age and older) living in households.” One of the objectives of the BFRSS is to accumulate and process state by state data of the U.S. population regarding preventative health practices and risk behaviors known to be connected to chronic diseases. Obesity is a main target of study, along with the dietary and physical activity behavior thought to contribute to the epidemic (Overview: BRFSS, 2012). The latest survey reports the US population is at 35.8 percent overweight and 28.1 percent obese, with the State of Nevada following closely at 36.3 percent overweight and 26.2 percent obese. The condition of obesity is characterized by an overall excessive storage of adipose tissue and diseased metabolic milieu.

Obesity is a major risk factor for several chronic diseases including hypertension, type 2 diabetes, cardiovascular disease, postmenopausal breast cancer, colon cancer, pancreatic cancer and all-cause mortality due to the physiological and morphological stresses placed on the body (Britten, Cleveland, Koegel, Kuczynski, & Nickols-Richardson, 2012; Wu, Gao, Chen, & van Dam, 2009).

Our biological predisposition to store excess fuel in an attempt to guard against periods of starvation as well as the increasingly availability of food, lend to an
environment of excess energy consumption. Ongoing advancements in technology and re-engineering of our physical surroundings to support minimal movement and increased convenience lead to an overall decrease in daily energy expenditure. Not only have we shifted our leisure time towards a more sedentary like environment, but also our workforce has also been altered. For instance, in 1970 only two in ten individuals worked in positions that required only light activity; i.e. working at a desk, and three out of ten American workers held a position with high energy output; i.e. manufacturing and farming. By the year 2000 the amount of positions requiring only light activity doubled whereas the high-energy output positions fell by 10 percent (Hill, Wyatt, Reed, & Peters, 2003).

In addition to these changes, total screen time (computers, watching TV, playing video games) and sitting time has also increased dramatically. More than half of the job positions held by Americans, required computer use and nine out of ten school aged children used computers in school. Time spent watching TV is approximated at four hours per day and total travel is approximately one hour. Methods of travel have changed favoring more sedentary methods such as driving a vehicle versus walking or riding a bike (Hill et al., 2003). Given these transitions of norms, it is no wonder that the remaining 33 percent of normal weight individuals are predicted to become overweight if they allow themselves to be influenced by this emerging trend and no action taken.

Methods to reduce the trajectory of obesity at an individual as well as on a population level are extremely important. Programs need to be individualized so that they are effectively geared towards the population being served.
The Position of the American Dietetic Association: Weight Management (the Academy of Nutrition and Dietetics formerly the American Dietetic Association) supports the development and implementation of a comprehensive, multipronged approach, based on scientific evidence and guidelines to treat overweight and obese individuals. These treatments should be based on lifestyle and behavior modification strategies that will result in “prevention of weight gain or stopping weight gain in an individual who has been seeing a steady increase in his or her weight; varying degrees of improvements in physical and emotional health; small maintainable weight losses or more extensive weight losses achieved through modified eating and exercise behaviors; and improvements in eating, exercise and other behaviors” (American Dietetic Association [ADA], 2009).

The gold standard for therapy is utilizing a team approach including a Medical Practitioner, a Registered Dietitian, Exercise Physiologist and Behavior Therapist. However ideal this situation might be, barriers such as increased cost, lack of reimbursement, and the unavailability of skilled weight management health care professionals make this lineup nearly impossible for most establishments (ADA, 2009). More commonly so, Registered Dietitians assume the role of designing and implementing such strategies with the help of evidenced based guidelines set forth by the Academy of Nutrition and Dietetics.

As a Registered Dietitian, I have worked with several populations in the community instructing them on principles of good nutrition and health benefits of physical activity. In general, what I have encountered is the lack of available programs created and tested that are geared not only towards educating the public on these vital
principles, but that also include the instruction of the skills necessary to implement these changes, and strategies for behavior change. Outcomes have been less than ideal in these populations I have served because of the above mentioned shortcomings.

**Purpose of the Study**

The purpose of this investigation will be to establish and evaluate the benefits of a weight management program, using the elements found in research to have the greatest impact on health related outcomes, held at the University of Nevada, Las Vegas campus, and how to best implement these findings into an ongoing community outreach program.

**Research Question**

My research question is: Does the addition of Cognitive Behavior Therapy techniques enhance the effects of Nutrition Education on the outcome of a weight management program?

My hypothesis is: The addition of cognitive behavior therapy techniques to nutrition education will result in greater weight loss and a reduction in health-risk related behaviors in a weight management program conducted at the UNLV Nutrition Center.

The null hypothesis is: The addition of cognitive behavior therapy techniques to nutrition education will not result in greater weight loss or a reduction in health-risk related behaviors in a weight management program conducted at the UNLV Nutrition Center.
CHAPTER 2

THEORETICAL AND EMPIRICAL REVIEWS

Obesity continued to increase over the past two decades and while data suggests the number of obese and overweight individuals is stabilizing, there is no sign of decline (BFRSS, 2012). For this reason multiple methods for conducting weight loss programs have been projected. Diet manipulation is one of the most common methods for weight control as a reduction in energy intake should result in a negative energy state leading to weight loss. Several diet manipulations exist but most are based on basic themes such as low carbohydrate-low fat, low carbohydrate-high protein, and low energy (Wu et al., 2009).

Although evidence does exist supporting these diet manipulations for short term weight loss, very few support any of these methods in weight maintenance over a long period of time; i.e. greater than two years. The addition of a physical activity component to a weight reduction program has also been perpetuated as a beneficial addition. Creating an energy deficit from increased activity will tip the scales further toward weight loss without the need to restrict energy as severely. Moreover, as a person continues to lose weight they experience a concurrent reduction in basal metabolic rate due to the decreased energy needed to support the previous body mass, as well as a reduction in energy expenditure to perform physical activities. These reductions in energy expenditure could make it more difficult for the person to continue to lose weight. However, increasing physical activity reverses these regulatory responses by increasing energy expenditure (Wu et al., 2009).
Given the positive effects of increased physical activity one would expect a greater degree of weight loss over diet therapy alone. Yet most of the scientific evidence suggests physical activity has only a modest effect on weight loss, with an average loss of only 1 to 2 kg. One would expect the magnitude of weight loss to be greater with an increase in physical activity over diet manipulation due to the increased energy expenditure; however this has not shown to be true. Several studies demonstrate decreasing energy intake has almost double the effect on weight loss over physical activity (Nonas & Foster, 2009).

Albeit these findings may seem discouraging, physical activity does have a role in the management of overweight and obesity. According to the National Weight Control Registry, the largest prospective investigation of long term successful weight loss, individuals with a sustained 30 pound or greater weight loss engage in at least 5 to 6 hours of moderate physical activity per week. In contrast, individuals who did not engage in physical activities regained most if not all the weight back one year post treatment (Nonas & Foster, 2009).

These findings are in accordance to the recommendations of physical activity for weight loss by the American College of Sports Medicine, the Institute of Medicine, the International Association for the Study of Obesity, and the 2010 US Dietary Guidelines for Americans. These agencies recommend at least 150 – 250 minutes per week of moderate-intensity physical activity for modest weight loss and greater than 250 minutes per week for clinically significant weight loss in addition to prevention of weight regain.
More recently, research has been focused on the effects of physical activity in the improvement of health-related outcomes independent of its effects on weight loss. In a study done by Berggren, Boyle, Chapman, and Houmard (2008) obese individuals were studied before and after gastric bypass surgery to determine the effects of weight loss on lipid oxidation. Previous studies had shown obese individuals have depressed lipid oxidation mechanisms, therefore the aim of this study was to determine if the addition of endurance type exercise would help to improve the lipid oxidation rate. It is well known that peripheral adaptations to endurance exercise lead to an increase in mitochondrial density in skeletal muscle, it was hoped then, this would then translate to an increased ability to oxidize lipid (Berggren et al., 2008).

In this study, three groups were examined: lean, obese, and previously obese individuals who had undergone bypass surgery to remove 50 kg of body fat. As was previously determined, obese individuals have a defect in the ability to oxidize lipid, however it was unknown whether a reduction in weight alone was enough to overcome this flaw. The gastric bypass individuals were examined 12 months post-surgery; since this is the time when the body returns to a stable condition. Skeletal muscle was biopsied from the three groups and fatty acid oxidation was evaluated in the lab. Both the obese group and the bypass surgery group demonstrated a significant difference in fatty acid oxidation and the ratio of incomplete to complete fatty acid oxidation was significantly elevated as compared to the lean individuals (Berggren et al., 2008).

All three groups then underwent a 10 week exercise training intervention that included 60 minutes per day of endurance-oriented exercise for 10 consecutive days. The exercise prescription modeled programs that improved whole-body fat oxidation or
increased mitochondrial density. All three groups were deferred from making changes to their diet. Muscle biopsies were again taken in the same fashion as before and were tested for complete fatty acid oxidation and the incomplete to complete fatty acid oxidation ratio was determined. A reduction in weight loss was not seen in any of the three groups at the end of the exercise program; however, fatty acid oxidation increased significantly in all three groups and the ratio of incomplete to complete oxidation significantly decreased in the bypass surgery group up to the normal level as seen in the lean group. A defective fatty acid oxidation level is linked with insulin resistance, type 2 diabetes, and weight gain. These findings suggest many of these conditions may be corrected in as little as 10 days of endurance type physical activity (Berggren et al., 2008).

This study gives us a platform to encourage participants to engage in physical activity even though they may not experience a significant weight reduction. Often patients are discouraged when they are not losing weight at their desired rate; however we need to speak to our clients about the health benefits of physical activity and the improvement in quality of life they will encounter by leading an active lifestyle. It would be interesting to investigate if subjects obtain the same results with shorter duration activity engaged throughout the day (i.e. 10 minute bursts of activity). Often patients that have not been active for quite some time may find it difficult to sustain 60 minutes of continuous moderate intensity activity. For this reason it may be more practical for these patients to spread out their workouts throughout the day instead of completing one long bout of exercise.

Higher levels of cardiorespiratory function have also been demonstrated in both men and women who have undergone an exercise program. Research supports an
improvement in cardiorespiratory health is related to improved health outcomes such as cardiovascular disease and type 2 diabetes. Thus, interventions should target an increase in physical activity up to the recommendations stated above for improvements in body composition, weight maintenance, as well as an improvement in health related outcomes associated with chronic diseases.

Poor compliance is often an issue in maintaining weight loss over time. For this reason, behavior modification strategies must be incorporated for the success of any weight loss program. Behavior modification in the treatment of obesity teaches clients specific skills that facilitate the client to improve their dietary patterns and physical activity habits to successfully achieve and maintain a healthy weight. Behavior modification is based on problem solving and goal setting to improve current habits but does not dive into psychotherapy issues such as how they were raised or their personal relationships. The main focus is on making small changes that can be achieved and maintained, rather than larger lofty changes that are too difficult to achieve and rarely last (Nonas & Foster, 2009).

Behavior modification strategies are individualized to the client’s needs and almost always include goal setting, behavior modification, self-monitoring, stimulus control, cognitive restructuring, stress management, social support, and relapse prevention. Goal setting allows the client to make realistic and achievable goals for changing their behavior. This prevents the client from having unrealistic expectations that can lead to neglecting the meaningful small changes. By setting achievable goals the client gets a sense of accomplishment that will reinforce further behavior change. Self-monitoring is the next component in behavior modification and it includes observing,
reflecting and recording certain behaviors. Clients are not only asked to record their food intake, physical activity and weight, but also their mood and other factors that may have influence over their decisions regarding intake and exercise (Nonas and Foster, 2009).

Stimulus control deals with the cues that prompt negative dietary and physical responses. Strategies involve removing undesirable food choices from the client’s environment and teaching the client simple ways to incorporate activity throughout the day. Cognitive restructuring helps the client believe in their ability to make these changes by replacing negative self-defeating thoughts with positive affirmations. Stress management involves finding coping mechanisms other than food to deal with negative situations and stressful conditions. Lastly, relapse prevention helps clients create personal strategies to deal with events that may occur that have previously led them to overeat (Nonas and Foster, 2009).

Researchers Werrij, Jansen, Mulkens, Elgersma, Ament & Hospers (2009) believed the use of cognitive therapy would prevent the undesirable cycles of losing weight and gaining weight seen in several individuals whom have participated in traditional weight loss treatments. The high incidence of relapse up to or even above former weight, led these researchers to conduct a study to determine whether the addition of cognitive therapy to a conventional dietary modification program would prevent relapse. An important factor to emphasize is that cognitive therapy has demonstrated to extend the strategies learned well beyond the treatment period. Most treatments are only effective during the time they are administered however effects of cognitive therapy are maintained well beyond the point of administration and facilitate the maintenance of desired behaviors (Werrij et al., 2009).
Werrij et al. (2009) study involved the addition of cognitive behavior therapy to a standard dietetic treatment for obesity offered by a Registered Dietitian. Two treatments were administered, the first a cognitive dietetic group treatment the other a physical exercise and dietetic group treatment. Both treatments had a total duration of 10 weeks composed of two hour weekly sessions. The first hour included the dietetic intervention lead by a Registered Dietitian and was exactly the same for both groups. The lesson plans included nutrition education emphasizing meal timing, mindful eating, healthy shopping, surviving holidays, use of food diaries and cooking classes. They were also given guidelines of a healthy diet but were not given a specific diet. The second hour differed in both groups; the control group engaged in low intensity physical activity guided by a qualified physiotherapist for the remaining hour and the experimental group received cognitive therapy by a qualified cognitive therapist (Werrij et al., 2009).

Cognitive therapy goals were to identify, challenge and change dysfunctional perceptions related to eating, control, weight, and shape, as well as feelings of self-esteem and interpersonal patterns of thought and behavior. Several hypotheses were tested and analyzed. Both treatment groups showed a decrease in the belief in dysfunctional thoughts throughout the treatment. Both treatments showed improvements in reducing concerns over weight and shape as well as improvements over mood and self-esteem. Both treatments showed a reduction in binge eating and an increase in restraint; however the cognitive therapy group showed a greater response in after treatment restraint and binge eating. Both treatments showed significant decreases in body weight during the short term showing no significant differences between groups. During the maintenance phase the cognitive therapy group had maintained the weight lost during
treatment but not after the conventional treatment. Moreover, individuals in the conventional treatment regained 25% of their initial weight loss whereas the cognitive therapy group showed no regain. There was a partial increase of weight and eating concerns seen in the conventional therapy group at follow up however the cognitive therapy group there was none (Werrij et al., 2009).

These findings indicate the long term benefits of cognitive therapy including weight loss, weight maintenance, an improvement in feelings toward weight, shape and eating, a decrease in binge eating as well as an improvement in self-esteem and lowered depression rate and most importantly has shown the prevention of relapse. Thus, adding cognitive therapy to weight loss programs is a valuable tool in optimizing treatment (Werrij et al., 2009). An important area these researchers failed to determine or investigate was whether the participant’s changes led to other health improvements besides weight loss and whether their attitudes towards health had improved such that they would continue to apply the principles learned. Another interesting area to investigate is if they extended the knowledge and habits to their family members and if the family had changed their health behaviors and/or created barriers to the change.

Nutrition education is the final component in the successful treatment of overweight and obesity. There is a wide array of nutrition information available to the public that can be easily accessed. However the proper use of this information and the knowledge of practical applications are required. For example, the dietary patterns constructed by the US department of Agriculture and released as part of the 2010 Dietary Guidelines for Americans are designed to meet the nutrient needs of individuals without exceeding individual energy requirements. They are categorized by different energy
levels and identify the correct amounts of each food group to consume in order to stay within the energy limit. These amounts are based on the assumption that individuals will select nutrient dense choices within the food groups. However there are other, energy dense options included in these same food groups that if consumed based on the recommended amounts would exceed the energy limits imposed and lead to weight gain (Britten, Cleveland, Koege1, Kuczynski, & Nickols-Richardson, 2012).

In a study conducted by Britten et al. (2012) national food consumption data were accumulated to determine the actual choices of the population within the given food groups. Intake information was acquired from the National Health and Nutrition Examination Survey conducted in 2003-2004. This information was used to develop an adjusted nutrient profile based on the energy contained in these foods. It was determined by these analyses that if the recommended quantities were consumed in each food group based on typical choices and not on nutrient dense choices, these result in diets that are high in energy, added sugars and added fats. Thus nutrition education is needed to help the consumer select foods and beverages that meet nutrient needs while at the same time minimize the intake of added fats and sugars. For many consumers it would be helpful to learn the general principles of energy density versus nutrient density in order to accomplish successful weight loss and management (Britten et al., 2012).

The main principles of reducing energy density include consuming more water and fiber rich foods such as fruits, vegetables, legumes and decreasing the proportion of high fat foods.
Masheb, Grilo, and Rolls (2011) conducted a study to determine the effects of a low-energy-density dietary approach in individuals with a history of weight loss resistance. Participants were randomly assigned to two different treatment groups: cognitive behavior therapy plus a low-energy diet and cognitive behavior therapy plus general nutrition counseling not related to reducing weight or lowering energy dense foods. Outcomes measured were reduction in weight, binge remission, energy density and servings of fruits and vegetables (Masheb et al., 2011).

The percent of individuals achieving a five percent or greater weight loss post treatment at six months as well as twelve months post treatment was the same in both groups. Both treatments showed significant improvements in behavioral outcomes such as binge eating episodes, less disinhibition and hunger and greater restraint and an improvement in concerns about weight, shape and eating concern as well as symptoms of depression. Significant increases were demonstrated in the consumption of fruits and vegetables and a decrease in fat intake in the energy density group more so than in the general nutrition group. Health related improvements in both groups included decreased BMI, blood pressure, waist circumference and cholesterol (Masheb et al., 2011). These are the desired results we would like to see in any weight reduction intervention; however this study did not reveal whether the subjects were able to live outside the prearranged diet prescription. Of course we want to see our subjects be successful in the intervention however most important is whether they are able to maintain these habits and if the education was extensive enough to allow the subject to appropriately select healthy food choices once the intervention had reached its conclusion.
All treatments described above have shown to independently improve the outcomes of a weight control program. Including all treatments in the same program should thus lead to a summative effect leading to further improvements in weight reduction and maintenance and improved health-related outcomes that may prevent the occurrence of chronic diseases such as cardiovascular disease, type 2 diabetes, cancer, and all-cause mortality. This type of programming would also be in accordance to the guidelines described in the Academy of Nutrition and Dietetics Position Paper on Weight Management.
CHAPTER 3

METHODOLOGY

Participants

Participants were recruited via flyers posted to all of the UNLV building’s department bulletin boards on campus, at the UNLV student union, and the Wellness and Recreation center. Blast departmental emails were sent out with the created flyer and advertisement via UNLV Today served as an additional avenue for recruitment. In-classroom visits were conducted to non-major Nutrition Sciences classes in an attempt to recruit additional student participants and the flyer was also posted on Webcampus for all Nutrition 121 students.

Eligibility criterion for candidates was based on three factors – (a) classification of overweight or obesity (calculated BMI greater than 24.9); (b) age of 18-65 years, and (c) previous attempt to lose weight. Individuals were excluded if they were currently taking medications designed to aid in weight loss or were participating in a weight loss program, were pregnant, lactating, < six months postpartum, or planned to become pregnant during the time of the investigation.

A convenience sample was taken from UNLV undergraduate students and faculty. Human subject rights were protected and research approval was granted by the UNLV Institutional Review Board prior to proceeding with the study. A total of twenty people replied to the recruitment flyers and announcements. Three people were excluded because they did not qualify based on requirement (a)- classification of overweight or obesity (calculated BMI greater than 24.9), and three people did not show up for their initial assessment nor did they respond to email inquiries of interest in participation in the
study. A total of fourteen participants successfully completed the initial assessment and the initial questionnaires.

**Study Design**

Participants were assigned to one of two conditions: (a) nutrition and physical activity education plus behavior modification techniques; (b) nutrition and physical activity education via handouts through email blast. Primary dependent variables were measured at baseline and post treatment. Due to time constraints, the three-month post treatment follow up assessment will not take place. The variables measured were dietary and physical activity behaviors, weight loss, body circumferences and triceps skinfold thickness.

Once all participants were measured and had completed the initial questionnaires they were randomly assigned to either group A or group B. Seven participants were assigned to group A- the meetings group and seven participants were assigned to group B- the email group. All participants were advised of their assignment via group email. The participants assigned to group A were informed of their assignment and were instructed to present themselves for the first group meeting on February 4th 2014 at 5:30 p.m. and every Tuesday thereafter for the next eight weeks. Participants assigned to Group B were advised of their group assignment and were instructed they were to read their first email on Tuesday, February 4th and every Tuesday thereafter for the next eight weeks. They were informed that the emails would contain a power point of the nutrition education topics along with notes to follow the power point.
**Intervention**

The intervention consisted of eight, 60-minute weekly meetings with nutrition education and behavior modification strategies offered at each session. Eight meetings were delivered on the UNLV campus grounds in building BHS room number 212. Sessions covered nutrition education and behavior skills such as self-monitoring using the USDA’s Supertracker program, stimulus control, cognitive reconstructing, reward center reprogramming, goal setting, stress management, social support, and relapse prevention (see table below and refer to Appendix for complete session outlines).

**Table 1. Summary of Weekly Class Meeting Topics and Activities**

<table>
<thead>
<tr>
<th>Session</th>
<th>Education</th>
<th>CBT Activity</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Principles of Weight Management &amp; Nutrients</td>
<td>Reward System Reprograming</td>
</tr>
<tr>
<td>2</td>
<td>Health Benefits of Physical Activity</td>
<td>SMART goals</td>
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<tr>
<td>3</td>
<td>Record Keeping &amp; Portion Control</td>
<td>Self-Monitoring</td>
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<td>4</td>
<td>Common Nutrition Myths</td>
<td>Emotional Eating &amp; Stimulus Control</td>
</tr>
<tr>
<td>5</td>
<td>Fad Diets</td>
<td>Stress Management</td>
</tr>
<tr>
<td>6</td>
<td>Nutrient Density &amp; Functional Foods</td>
<td>Cognitive Reconstructing</td>
</tr>
<tr>
<td>7</td>
<td>Shopping on a Budget</td>
<td>Social Support</td>
</tr>
<tr>
<td>8</td>
<td>Surviving the Holidays</td>
<td>Relapse Prevention</td>
</tr>
</tbody>
</table>

**Group Meetings**

**Session 1- Principles of Weight Management & Nutrients; Reward System Reprograming**

In session one the difference between macronutrients and micronutrients and the role each play in relation to good health were explained. Furthermore, each one of the energy producing macronutrients (carbohydrate, protein, & fat), the amount of energy each nutrient provides and the principle function of each nutrient was described. The
The notion was to have participants move beyond the general principle that food is mere energy and to consider each food based upon its nutrient profile or resume. All food gives us energy, but certain foods also contain vitamins, minerals, phytonutrients and antioxidants that our body depends on for good health. It was important that each participant understood how food contributed to health so that when participants were no longer part of the study they would be able to make informed decisions about their food selection based on these principles. Participants received several examples and tips on how to incorporate these foods into their diet. The main role of essential vitamins and minerals and where these could be found in the diet were also discussed (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session one behavior modification technique was on reward center reprogramming. The idea was to help participants use an ulterior method of rewarding themselves other than food. Each participant was given a glass jar, motivational stickers, colored letters and markers to create their own personal reward jar. Each participant came up with a list of activities they had wanted to do but thought they could not afford to. Examples included concert tickets, a book, a new CD, a massage, new clothes. The participants were instructed to use the jar each time they were tempted to eat something unhealthy; they were to put the same amount of money they would have spent on the unhealthy food into the jar. At the end of the month they were to use the money in their jar for one of the activities on their list, and to continue using the jar in the same fashion throughout the study (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).
Session two covered the impact physical activity has on reducing the risk of chronic diseases such as cardiovascular disease, diabetes, some cancers, osteoporosis, sarcopenia, and weight management. The impact physical inactivity and its contribution to the development of the above-stated diseases were also explored during the session. Physical Activity Guidelines for Americans (2008) were used to advise the participants on the type, intensity, and quantity of physical activity needed to receive the benefits of physical activity and disease prevention. Methods of overcoming barriers to physical activity were also discussed and each participant was instructed to think of their own personal barriers to physical activity. Methods to overcome each one of their barriers were brainstormed, and each participant wrote in their journal three methods they would test (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session two behavior modification technique was about setting SMART goals. Each participant was asked to set three goals related to physical activity. An open discussion was held regarding their goals and each examined how to transform these goals using the SMART model (Mahan et al., 2012). The SMART method is defined as a goal that is Specific, the what, why, and how; Measurable, having tangible evidence that the goal has been accomplished; Achievable, makes the person feel lightly challenged but not impossible, and is followed with steps defined well enough so that the goal can be achieved. In order for the goal to be achievable the person must also have the appropriate knowledge, skills, and ability to achieve the goal. Results-focused goals put emphasis on the outcome of a behavior, not the activity; and Time bound, the goal must be linked with
a time frame so that it creates a sense of urgency in the participant to accomplish the goal (Mahan et al., 2012).

Session 3: Record Keeping & Portion Control; Self-monitoring

In session three the benefits of keeping a personal record of food intake and minutes of exercise performed was discussed. Some of the benefits discussed were awareness: learning about energy content of food and how to identify it, becoming aware of what is actually eaten and finding trends; gaining control over what is eaten- when what is eaten is known changes can be made; change cannot occur on the unknown. Learning about eating patterns was introduced such as: eating because of emotions or hunger, waiting too long between meals, excessive snacking, etc., and learning how to “bank” calories in order to enjoy special occasions without “breaking the bank.”

This session also taught the participants how to control portion sizes. First and foremost the participants needed to learn what a serving size was in order to accurately keep a food log. Food models were displayed of all the different food groups so that the participants could accurately distinguish between a portion size and a serving size. A serving size is a measured quantity of food, a portion size is any quantity of food that is served but not measured. Most people use portion sizes to track their energy intake not serving sizes, this can lead to underestimating the quantity of food consumed throughout the day and ultimately lead to weight gain over time. The different methods of controlling serving sizes were presented, these included measuring (using measuring cups, measuring spoons, and visuals), weighing (using a food scale), and counting (counting servings such as nuts and chips). The participants were taught how to read a food label and how to use the information not only to eat the appropriate quantity of food, but also to use the
information for their food log. Tried and true tips (Nonas and Foster, 2009; Rolls et al., 2000) and methods for controlling portion sizes were given to provide participants with further resources. Some of the methods discussed were eating more slowly, starting the meal with a salad or soup, practicing mindful eating, eating while not distracted, using smaller utensils, plates and bowls and avoiding meal deals (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session three behavior modification technique was about self-monitoring. Each participant was given an instruction booklet on how to create a profile on the USDA’s Supertracker program. This program was to be used throughout the study to identify each participant’s energy requirements, macronutrient breakdown, and to track their food intake and physical activity. A demo of the program was done in class highlighting the program components the participants were asked to use (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session 4: Common Nutrition Myths; Emotional Eating & Stimulus Control

In session four we discussed several different nutrition myths and replaced them with facts about weight management. In general, nutrition myths come from the media, talk show personalities, celebrities, personal trainers, family and friends. Most myths are based on too good to be true gimmicks that may generate results in the short term but do not produce change in behavior and thus long lasting results are not achieved. The common denominators between these myths are that they cut back on total energy and restrict certain food groups. Some, more peculiar myths claim certain foods burn fat or
that taking certain herbal supplements such as keytone raspberries will burn fat without requiring any additional increase in activity or change in diet (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Facts about weight management that have been reported to work include portion control, moderation, increase in physical activity, self-monitoring and awareness, and following a balanced diet that includes all the major nutrients including fruits, vegetables, whole grains, lean proteins, and healthy fats (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session four behavior modification technique was about emotional eating and stimulus control. Each participant was instructed to write down their emotional state each time they used their food log. Every time they ate, they were to write down their food intake as well as their emotional condition and hunger level. This would help them to determine if they were eating because of hunger or due to emotion. If they were eating because of an unpleasant emotion, they were to explore that emotion further in their journal. This activity would allow them to identify what their personal triggers were that led them to eating. Once the triggers were recognized, they were instructed to come up with methods of dealing with their emotions other than turning to food. Each participant came up with a list of three to five activities they were going to try when they were experiencing a trigger, and then they were to document whether or not that method helped relieve that emotional condition. If it worked they were to highlight that activity, if it did not work they were to cross it off their list. The end result would be that they had
several methods, shown to work for them personally, that they could use to channel their emotions instead of using food as their outlet (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session 5: Fad Diets; Stress Management

Session five- fad diets, was a continuation of session four- common nutrition myths, as these two topics go hand in hand with each other. It was important to talk about the pros and cons about each diet because usually fad diets are based on a true principle. However, they are then misconstrued into an overall unhealthy, unbalanced diet. The purpose of this session was to help participants identify fad diets so that when they were no longer a participant in the study, they would be able to detect a fad diet on their own, and not fall victim to the hype. One of the goals of this study was to instill long lasting behavior change that could lead to a healthy lifestyle. Therefore, it was necessary to learn about fad diets because if a participant was deceived by the hype of the diet, it could lead them to engage in unhealthy behaviors and may cause them to forget some of the healthy habits they created during the study. Awareness of healthy as well as unhealthy diets may be keys to succeeding in the long term. Some of the fad diets we discussed were the Atkins/Low Carb Diet, Paleo Diet, Cabbage Soup Diet, HCG Diet and the Master Cleanse Diet. Proven methods of weight management were once more discussed. These include portion control, moderation, increase in physical activity, self-monitoring and awareness, and following a balanced diet that includes all the major nutrients including fruits, vegetables, whole grains, lean proteins, and healthy fats (Nonas and Foster, 2009;
Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session five behavior modification technique was on stress management. Each participant was given a journal at the beginning of the study and was encouraged to use the journal ad lib. During session five, they were given instruction on how to use their journal. Anytime they felt like they were experiencing an unpleasant situation; be it anxiety, depression, stress, etc., they were asked to write freely in their journal about the emotions and feelings they were experiencing. The journal was to serve as yet another tool in their toolbox for them to utilize to approach their feelings and emotions in a constructive way (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

**Session 6: Nutrient Density & Functional Foods; Cognitive Reconstructing**

The content of session six allowed for participants to develop a deeper understanding of the nutrient profile of foods and how to use nutrient dense food for weight management and health promotion. Certain foods contain chemical substances that may potentially exert a positive effect on the body such as to reduce the risk of disease or promote optimal health beyond basic nutrition. Some examples of these substances include phytochemicals, antioxidants, and beta glucan. These chemical substances are generally found in colorful fruits and vegetables, whole grains, legumes, soy, nuts and seeds, tea and coffee (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007; Kelsey et al, 2011).
Nutrient density refers to the ratio of healthy, beneficial nutrients that a food contains to the amount of energy it provides. Nutrient-dense foods provide vitamins, minerals, fiber, antioxidants and phytochemicals, and are low in energy. Energy dense foods provide little to no essential nutrients and are loaded with added fats, sugars, and preservatives, and are high in energy. In order to lose weight less food must be consumed or more energy must be burned. Eating less food and exercising more can leave individuals feeling hungry. Research has shown that people generally eat the same volume of food even if the energy content of the food differs (Rolls & Barnett, 2000). In order to combat the feeling of hunger, it is recommended to eat the same or more volume while eating less energy. Foods that are nutrient dense are generally excellent sources of fiber and water; these take up a lot of space and yet are low in energy (Rolls & Barnett, 2000) The idea is to fill up on these foods so that feelings of deprivation or hunger do not occur since the person is consuming the same volume of food, getting more essential nutrients, and eating less energy (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session six behavior modification technique was on cognitive restructuring, which could help to promote changes in thought patterns regarding a person’s ability to achieve its goals. According to CBT experts, most emotions and behaviors are the result of what is thought or believed about oneself, other people, and of the world. These perceptions shape how people interpret and evaluate what happens to them, influence how they feel about it, and provide a guide to how they should respond. Sometimes underlying thoughts are not useful or helpful. The idea of positive thinking and becoming
more aware of inner thoughts was used in order to bring about change in the participant’s own perceived capability to succeed with their healthy changes in the long term (Nonas & Foster, 2009).

Feelings of defeat such as negative predictions about a person’s actions or capabilities could derail weight loss attempts and weight maintenance. Modifying the belief in one’s ability to succeed by adding positive affirmations could help motivate and encourage participants to succeed in achieving their goals. Such positive affirmations included “I love how I feel after I finish a work out”; “I am achieving my weight loss goals so far”; “I want to take care of my body”; “I think about what I eat”. Participants were asked to write down these affirmations in their journal and to read them daily. The participants were also encouraged to write down in their journal any positive sayings or quotes they encountered throughout the week that they felt would help them change the way they thought about their personal ability to succeed (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

Session 7: Healthy Shopping on a Budget; Social Support

In practice, several individuals have confessed the main reason preventing them from eating healthier is because they believe healthy food is more costly and do not believe they can afford to eat that way. The purpose of session seven was twofold – to teach participants how to save money at the grocery store and how to choose healthy foods. Several methods of saving money were discussed including using different apps and websites geared towards saving money, creating weekly menus based on grocery
store advertisements, price matching, using local co-ops, buying in bulk, and how to extend the life of groceries to minimize waste.

The second part of the presentation consisted of teaching participants how to select healthy food items at the grocery store. These methods included shopping the perimeter to find whole, unprocessed foods, buying in-season fruits and vegetables for the most nutrition and flavor, types of lean proteins, healthy fats, whole grains, and low-fat dairy and dairy substitutes. The presentation also included several recipes using fresh and wholesome ingredients that were inexpensive and easy to prepare. The participants learned how they could use the food label and ingredient list to distinguish between healthy and processed food, including what key words to look out for such as “partially hydrogenated oil,” sugar and sodium pseudo names, and what preservatives to limit or avoid. Several demo food labels were used so that participants could locate, on their own, where on the label they could find the sodium, cholesterol, sugar, fiber, and fat content of foods. They also learned about serving sizes and how they affected the numbers displayed on the label. An example of a grocery list and pantry list was given to each participant; these lists included the foods discussed during the presentation.

Session seven behavior modification technique was on social support. Finding encouragement and support may be helpful for people losing weight. However finding the right person or group is important because some people may end up hindering rather than supporting weight loss goals. The participants were asked to think about this concept, and to take notice of people that did not encourage and support their successes (un-motivators) and to find people that were encouraging and supportive of their successes (motivators). Having people listed this way, would remind them to only share
their journey with the motivators and avoid disclosing such information to the un-motivators (Nonas and Foster, 2009; Mahan et al., 2012; Kellogg, 2009; Gropper et al., 2009; Donnelly et al., 2009; Constance, 2011; ADA, 2009; Biesemeier et al., 2007).

As an example for the social support technique, a Facebook group page was created for the participants. The group was private so that only the participants had access to the group. This would ensure privacy and allow participants the freedom to post whatever they felt was encouraging and helpful to the group. The participants used the page to post motivational quotes, recipes, and goals they had met throughout the week. The participants encouraged and motivated each other on their successes and helped each other through struggling times. At the end of the study the participants were informed that the Facebook page would be shut down and were asked to find a new way to stay engaged and supported. The participants expressed they had all become friends on Facebook and were going to continue to motivate each other through this method.

Session 8: Surviving the Holidays; Relapse Prevention

Session eight covered tips and tricks on how to prevent the usual weight gain surrounding the holidays. The main topics were to be mindful of energy dense foods including sweets, beverages, and holiday dishes and to continue practicing portion control. Instruction of how to modify recipes was given in order to reduce the total fat and sugar content thereby reducing total energy, and how to use substitutes to create flavorful and healthy meals. Participants were guided on ways of staying focused with their weight loss goals by continuing to log their food intake and physical activity, as well as their hunger level and emotional state when eating. The journal would help keep them accountable and in control of their actions throughout the holiday (Nonas and Foster,
Session eight behavior modification technique was on relapse prevention. This included a discussion of strategies to deal with situations that may lead to relapse such as holidays, vacations, or celebrations. Participants were reminded of the importance of using their support system to keep them encouraged and accountable so that they would stay on track with their goals. Methods for keeping a “clean” food environment were introduced to further prevent relapses. Ways to control one’s personal environment include getting rid of unhealthy foods at home, keeping healthy snacks available, prepping for the week ahead, mindful eating, and using the plate method not only at home but also while away. The participants were asked to think about all the methods that were introduced during the study and to continue using the strategies they felt were most beneficial. This step would be important so that they could continue to succeed and to help them maintain the healthy habits they created during the study (Nonas and Foster, 2009).

**Assessment**

Assessment data were collected both prior to and at the end of the study. Six surveys were uploaded onto Qualtrics Online Survey Solutions (www.qualtrics.com); four surveys were created to assess behavior change and nutrition knowledge and two surveys were created to assess which of the eight behavior modification techniques participants thought helped them change their behavior the most during the study. The information collected in this survey would be used to perfect future programs offered at the UNLV Nutrition Center. Individual survey links were generated via Qualtrics Online
Survey Solutions (www.qualtrics.com) for each participant in order to gain access to the six questionnaires. Each participant completed a general nutrition knowledge questionnaire pretreatment to test baseline nutrition knowledge and again post treatment to test nutrition knowledge accretion and retention. All participants completed a health risk behavior questionnaire based on two existing surveys that have been used in national level health research for more than a decade. These surveys included questions from NHANES-III and BFRSS 2013. Each participant completed the same questionnaire post treatment to document whether a change in behavior had been achieved (Refer to Appendix for full questionnaires).

**Anthropometric Measurements**

Anthropometric measurements were collected at baseline and post treatment for height, weight, waist circumference, hip circumference and triceps skinfold thickness. A medical balance beam scale equipped with a measuring rod (Health o meter 450KL Scale, Sunbeam Product Inc DBA Jarden Consumer Solutions) was used to measure participant’s height. A medical scale (Tanita BWB-800, Tanita Corporation of America, Inc., Arlington Heights, IL 60005) was used to measure participant’s weight. Height was measured in inches and converted to meters by multiplying by 2.54 and then dividing by 100. Weight was measured in pounds and converted to kilograms by dividing by 2.2. The body mass index (BMI) was calculated as weight in kilograms divided by height in meters squared (BMI= kg/m²). A body circumference measuring tape (QM2000) was used to measure participant’s waist and hip circumferences. The waist to hip ratio (WHR) was calculated at the site recommended by the Anthropometric Standardization Manual (Lohman, et. al. 1991). A Lange Skinfold Caliper (Beta Technology, Santa Cruz, CA 95060) was used to measure the triceps skinfold thickness. The skinfold site was...
measured halfway between the tip of the olecranon process of the ulna and the acromion process of the scapula as indicated in the Lange Skinfold Caliper Operator’s Manual 2008.
CHAPTER 4

FINDINGS OF THE STUDY

Statistical Analysis

All questionnaires were uploaded to Qualtrics (Qualtrics LLC, Provo, Utah), a supplier of data collection and analysis, which served as both the vehicle for administering the questionnaires as well as the program for providing the data for analysis. There were also paper versions of the questionnaires available for those individuals without computer access, however these were ultimately unnecessary. Descriptive statistics were achieved using Microsoft Excel 2010 (Microsoft Corporation, One Microsoft Way, Redmond, WA 98052). Repeated Measures Univariate Analysis of Variance was conducted to examine the mean differences across time, between groups and the interaction of pre and post treatment body weight, body circumferences and behavior change. A significance level of .05 was used for all tests. Statistical analysis was accomplished using SPSS (SPSS Inc., 233 S Wacker Drive, Chicago, IL 60606), version 21.

Data Analysis

Sample characteristics

Descriptive data for the participants is summarized in tables 2 and 3. The total sample size was of 10 participants. Four participants dropped out of the study after group assignments had been made. There was 100% participation for group A. The mean age for group A was 35 years (S.D. = 12.72) and gender distribution was 100 percent females and zero percent males. The mean age for group B was 36 years (S.D. = 8.59) and gender distribution was sixty percent females and forty percent males. Mean weight for group A
was 175.16 pounds and 211.8 pounds in group B. Mean waist circumference in group A was 34.2 and 38.3 inches in group B. Mean hip circumference in group A was 43.5 inches and 46.7 inches in group B. Mean triceps skinfold thickness in group A was 24.4 millimeters and 23.8 millimeters in group B. Mean age for dropout participants was 36 and gender distribution was 75% females and 25% males. Mean weight was 188, mean waist circumference was 34.7, mean hip circumference was 44.6 and mean triceps skinfold thickness was 23.75. No meaningful difference in means was found between participant dropouts and groups A and B.

Table 2. Descriptive Statistics for Participants Assigned to two Different Treatments.

<table>
<thead>
<tr>
<th>Category</th>
<th>Sample (n)</th>
<th>Group A Pretreatment Mean</th>
<th>Group A Posttreatment Mean</th>
<th>Group B Pretreatment Mean</th>
<th>Group B Posttreatment Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (lbs.)</td>
<td>5</td>
<td>175.1 (S.D. 29.6)</td>
<td>176.2 (S.D. 29.2)</td>
<td>211.8 (S.D. 69.6)</td>
<td>211.6 (S.D. 71.8)</td>
</tr>
<tr>
<td>Waist (in.)</td>
<td>5</td>
<td>34.2 (S.D. 15.8)</td>
<td>33.4 (S.D. 4.39)</td>
<td>38.3 (S.D. 5.24)</td>
<td>37.7 (S.D.)4.96)</td>
</tr>
<tr>
<td>Hip (in.)</td>
<td>5</td>
<td>43.5 (S.D. 4.84)</td>
<td>42.1 (S.D. 5.83)</td>
<td>46.7 (S.D. 8.21)</td>
<td>46.1 (S.D. 7.98)</td>
</tr>
<tr>
<td>Triceps (mm)</td>
<td>5</td>
<td>24.4 (S.D. 6.18)</td>
<td>23.4 (4.92)</td>
<td>23.8 (S.D. 12.67)</td>
<td>23.6 (11.71)</td>
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<tr>
<td>Behavior score</td>
<td>5</td>
<td>39.2 (S.D. 7.49)</td>
<td>51.2 (S.D. 7.15)</td>
<td>31.6 (S.D. 6.18)</td>
<td>42 (S.D. 9.05)</td>
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<tr>
<td>Knowledge score</td>
<td>5</td>
<td>77.8 (S.D. 7.29)</td>
<td>91.8 (S.D. 7.39)</td>
<td>69.4 (S.D 9.39)</td>
<td>82 (S.D. 10.27)</td>
</tr>
</tbody>
</table>

Table 3. Descriptive Statistics for Participants that Dropped out After Group Assignments.

<table>
<thead>
<tr>
<th>Category</th>
<th>Sample (n)</th>
<th>Dropout Pretreatment Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (lbs.)</td>
<td>4</td>
<td>187.9 (S.D. 29.59)</td>
</tr>
<tr>
<td>Waist (in.)</td>
<td>4</td>
<td>34.7 (S.D. 2.21)</td>
</tr>
<tr>
<td>Hip (in.)</td>
<td>4</td>
<td>44.6 (S.D. 3.77)</td>
</tr>
<tr>
<td>Triceps (mm)</td>
<td>4</td>
<td>23.75 (S.D. 2.63)</td>
</tr>
</tbody>
</table>
Differences in Weight Change, Waist Circumference Change, Hip Circumference Change and Triceps Skinfold Change

Data for differences in anthropometrics are summarized in table 3. There was no significant change in weight across time ($F = .107, p = .751$), there was no significant difference between groups ($F = 1.110, p = .323$), there was no interaction ($F = .171; p = .690$). There was a significant difference in inches lost about the waist across time ($F = 5.6, p = .045$), there was no difference between groups ($F = 2.04, p = .191$), there was no interaction ($F = .114, p = .744$). There was a significant difference in inches lost about the hips across time ($F = 8.989, p = .017$), there was no significant difference between groups ($F = .691, p = .430$), there was no interaction ($F = 1.438 p = .265$). There was no significant difference in millimeters lost about the triceps across time ($F = 1.714, p = .227$), there was no significant difference between groups ($F = .001, p = .974$), and there was no interaction ($F = .762, p = .408$).

**Table 4. Results: Anthropometric Data**

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Weight Change</th>
<th>Waist (inches)</th>
<th>Hip (inches)</th>
<th>Triceps skinfold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Across time</td>
<td>$F = .107$</td>
<td>$F = 5.6$</td>
<td>$F = 8.989$</td>
<td>$F = 1.714$</td>
</tr>
<tr>
<td></td>
<td>$p = .751$</td>
<td>$p = .045$</td>
<td>$p = .017$</td>
<td>$p = .227$</td>
</tr>
<tr>
<td>Between groups</td>
<td>$F = 1.110$</td>
<td>$F = 2.04$</td>
<td>$F = .691$</td>
<td>$F = .001$</td>
</tr>
<tr>
<td></td>
<td>$p = .323$</td>
<td>$p = .191$</td>
<td>$p = .430$</td>
<td>$p = .974$</td>
</tr>
<tr>
<td>Interaction</td>
<td>$F = .171$</td>
<td>$F = .114$</td>
<td>$F = 1.438$</td>
<td>$F = .762$</td>
</tr>
<tr>
<td></td>
<td>$p = .690$</td>
<td>$p = .744$</td>
<td>$p = .265$</td>
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</tr>
<tr>
<td>Sample (n)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
Differences in Dietary and Physical Activity Behavior and Nutrition Knowledge Change

Data for differences in behavior and nutrition knowledge scores are summarized in table 4. There was a significant change in behavior scores across time \( (F= 11.16, p = 0.10) \), there was a significant difference between groups \( (F= 6.120, p = .038) \), and there was no interaction \( (F= .057, p = .817) \). There was a significant change in nutrition knowledge scores across time \( (F = 29.531, p = .001) \), there was no significant difference between groups \( (F = 3.425 p = .101) \), there was no interaction \( (F= .082, p = .782) \).

Table 5. Results: Behavior & Nutrition Knowledge Scores

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Weight Change</th>
<th>Waist (inches)</th>
<th>Hip (inches)</th>
<th>Triceps skinfold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Across time</td>
<td>( F = .107 )</td>
<td>( F = 5.6 )</td>
<td>( F = 8.989 )</td>
<td>( F = 1.714 )</td>
</tr>
<tr>
<td></td>
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<td>( p = .045 )</td>
<td>( p = .017 )</td>
<td>( p = .227 )</td>
</tr>
<tr>
<td>Between groups</td>
<td>( F = 1.110 )</td>
<td>( F = 2.04 )</td>
<td>( F = .691 )</td>
<td>( F = .001 )</td>
</tr>
<tr>
<td></td>
<td>( p = .323 )</td>
<td>( p = .191 )</td>
<td>( p = .430 )</td>
<td>( p = .974 )</td>
</tr>
<tr>
<td>Interaction</td>
<td>( F = .171 )</td>
<td>( F = .114 )</td>
<td>( F = 1.438 )</td>
<td>( F = .762 )</td>
</tr>
<tr>
<td></td>
<td>( p = .690 )</td>
<td>( p = .744 )</td>
<td>( p = .265 )</td>
<td>( p = .408 )</td>
</tr>
<tr>
<td>Sample (n)</td>
<td>10</td>
<td>10</td>
<td>10</td>
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</tr>
</tbody>
</table>

Consumer Satisfaction Data

At the beginning of the study the behavior modification techniques participants indicated would be the most helpful in changing behavior were “recognize events and situations that led you to overeat” (88 % of participants), “discover methods to cope with stress” (88% of participants), “believe in your ability to succeed” (88% of participants). Post treatment, the behavior modification techniques participants indicated worked best in changing behavior were “retrain your brain- learn healthy ways to reward yourself” (90% of participants), “track your diet and physical activity” (67% of participants) and “connect with people that share your goals (86% of participants).
Table 6. Results: Consumer Satisfaction Data

<table>
<thead>
<tr>
<th>n</th>
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<th>Post Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Recognize events and situations that lead you to overeat</td>
<td>Retrain your brain – learn healthy ways to reward yourself</td>
</tr>
<tr>
<td>5</td>
<td>Discover methods to cope with stress</td>
<td>Track your diet and physical activity</td>
</tr>
<tr>
<td>5</td>
<td>Believe in your ability to succeed</td>
<td>Connect with people that share your goals</td>
</tr>
<tr>
<td></td>
<td>88%</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>88%</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>88%</td>
<td>86%</td>
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</table>
CHAPTER 5
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Discussion of Results

Differences in Weight Change, Waist Circumference Change, Hip Circumference Change, and Triceps Skinfold Change

Group A gained 5.2 pounds with a mean gain of 1.04 pounds during the treatment period; 40% of the group gained weight, and 60% maintained their weight. Group B maintained their weight as a group; 60% of the group gained weight and 40% of the group lost weight. There was no significant change in weight across time (F = .107, p = .751), there was no significant difference between groups (F = 1.110, p = .323), and there was no interaction (F = .171; p = .690). Although there were no significant differences between groups in weight loss, it is important to note that only one person gained most of the weight in group A and the other participants in group A maintained their weight.

According to the Position Stand of the Academy of Nutrition and Dietetics on Weight Management a program is successful when the “…prevention of weight gain or stopping weight gain in an individual who has been seeing a steady increase in his or her weight; varying degrees of improvements in physical and emotional health; small maintainable weight losses or more extensive weight losses achieved through modified eating and exercise behaviors; and improvements in eating, exercise and other behaviors” (American Dietetic Association, 2009).

In the initial assessment 90% of participants had reported trying to lose weight over the past twelve months using methods such as limiting certain food groups, eating less food, following fad diets and skipping meals at the end of the study the participants
reported their new methods of weight control were eating more nutrient dense foods, portion control and exercise. The Participants that paid attention to portion control increased from 20% to 70% post treatment. Methods of portion control changed from 60% of participants using the “guess” method to only 10% relying on this method, participants using the “weighing” method increased from 0% to 10%, participants using the “food models” method increased from 10% to 20%, participants using the “plate” method increased from 0% to 40% and participants using no form of portion control decreased from 30% to 10%. Most participants increased their activity levels and decreased sedentary time. Participants selecting zero minutes of physical activity decreased from 60% to 30%, participants engaging in 30-60 minutes of physical activity increased from 20% to 40% and participants engaging in more than 60 minutes of physical activity increased from 0% to 10%. Total sitting time decreased; participants that reported sitting for 8-10 hours per day decreased from 60% to 20%, participants watching television for 3 hours or more decreased from 50% to 20% and participants using the computer outside of work or school for more than five hours decreased from 10% to 0% and participants that reported computer use for 1-2 hours decreased from 50% to 20%. In addition, all but two participants in the email group gained weight. The two participants that lost weight reported they received a Fitbit as part of a wellness initiative at their workplace and this device had helped keep them motivated to stay active.

The changes the participants demonstrated are in accordance to the recommendations for weight loss and weight control set forth by the Academy of Nutrition and Dietetics (ADA, 2009).
Group A lost a total of 4 inches, mean loss of 0.8 inches off their waist circumference; 80% of participants lost inches and 20% maintained. Group B lost a total of 3 inches, mean loss of 0.6 inches; 60% of the group lost inches and 40% maintained. There was a significant difference in inches lost about the waist across time (F = 5.6, p = .045), there was no difference between groups (F = 2.04, p = .191), there was no interaction (F = .114, p = .744). Group A lost a total of 7 inches, mean loss of 1.4 inches off their hip circumference; 80% of the group lost inches, 20% maintained. Group B lost a total of 3 inches, mean loss of 0.6 inches; 60% of the group lost inches and 40% maintained. There was a significant difference in inches time (F = 8.989, p = .017), there was no significant difference between groups (F = .691, p = .430), and there was no interaction (F = 1.438 p = .265). Although the participants did not lose weight in pounds, most participants lost inches around the waist; this is significant because waist circumference is an independent risk factor for heart disease. According to the Nurses’ Health Study, one of the longest prospective cohort studies to date, has examined the relationship between abdominal obesity and death from heart disease. Participants with a reported waist size of 35 inches or greater had nearly double the risk of dying from heart disease compared to those who had the lowest waist circumference (Zhang, Rexrode, van Dam RM, Li, & Hu FB, 2008). In group A, four of the five participants lost inches off their waist and in group B, three of the five participants lost inches off their waist. These results can be attributed to the increase in physical activity, decrease in sedentary time, and change in diet behavior as indicated above.

Group A lost a total of 5 millimeters, mean loss of 1 millimeter off their skinfold thickness; 40% of the group lost millimeters and 60% maintained. Group B lost a total of
1 millimeter, mean 0.2 millimeters off their skinfold thickness; 20% gained, 20% lost, and 60% maintained. There was no significant difference in millimeters lost about the triceps across time (F = 1.714, p = .227), there was no significant difference between groups (F = .001, p = .974), and there was no interaction (F = .762, p = .408). The two participants that displayed loss of skinfold thickness reported engaging in resistance type training (kickboxing and crossfit). Skinfold thickness is a measure of subcutaneous fat that could respond favorably with the addition of resistance type training. The decrease in skinfold thickness these participants demonstrated, correspond with studies examining the change in fat-free mass with resistance type training (Cullin, & Caldwell, 1998). In addition the participants that increased their levels of physical activity may demonstrate an increase in fatty acid oxidation, which may lead to improvements in overall health (Berggren et al., 2008). As Berggren et al. revealed a defective fatty acid oxidation level is linked with insulin resistance, type 2 diabetes, and weight gain. In Berggren’s study, none of the participants lost weight however, all participants engaging in physical activity demonstrated improvements in fatty acid oxidation. Therefore, the participants who increased their level of physical activity should receive these same benefits even though weight loss was not achieved.

Differences in Dietary and Physical Activity Behavior and Nutrition Knowledge Change

There was a significant change in behavior scores across time (F= 11.16, p = 0.10), there was a significant difference between groups (F= 6.120, p = .038), there was no interaction (F= .057, p = .817). Key recommendations from the Dietary Guidelines for Americans 2010 are to balance calories with physical activity to manage weight, limit screen time, monitor food intake, choose smaller portions, consume more of certain foods
and nutrients such as fruits, vegetables, whole grains, fat-free and low-fat dairy products, and seafood, and to consume fewer foods with sodium, saturated fats, trans fats, cholesterol, added sugars, and refined grains. The most important changes that occurred in the participants were in accordance to the recommendation set forth in The Dietary Guidelines for Americans and Physical Activity Guidelines for Americans. In group A, participants that reported consuming 1-3 servings decreased from 40% to 0%. Participants that reported consuming 4-6 servings of fruit increased remained the same 40% and participants reporting greater than 6 servings increased from 20% to 60%. In group B, participants that reported consuming 0 servings of fruits remained the same 20% and participants consuming 1-3 servings increased from 40% to 60%. Participants that reported consuming 4-6 servings of fruit decreased from 40% to 0% and participants reporting greater than 6 servings increased from 0% to 20%. In group A, participants that reported consuming 0 servings of green colored vegetables decreased from 20% to 0% and participants that reported consuming 1-3 servings decreased from 40% to 20%. Participants that reported consuming 4-6 servings of green colored vegetables remained the same and participants that reported consuming more than 6 servings increased from 20% to 40%. In group B, participants that reported consuming 0 servings of green colored vegetables decreased from 20% to 0% and participants that reported consuming 1-3 servings remained the same 40%. Participants that reported consuming 4-6 servings of green colored vegetables decreased from 40% to 20% and participants that reported consuming more than 6 servings increased from 0% to 40%. In group A, participants that reported consuming 1-3 servings of orange colored vegetables decreased from 100% to 40%. Participants that reported consuming 4-6 servings of orange colored vegetables
increased from 0% to 40% and participants that reported consuming more than 6 servings increased from 0% to 20%. In group B, participants that reported consuming 0 servings of orange colored vegetables decreased from 40% to 20% and participants that reported consuming 1-3 servings remained the same 60%. Participants that reported consuming 4-6 servings of orange colored vegetables increased from 0% to 20% and participants that reported consuming more than 6 servings remained the same 0%. In group A, participants that reported consuming 1-3 servings of whole grains remained the same 20%, participants that reported consuming 4-6 servings of decreased from 60% to 25% and participants that reported consuming more than 6 servings increased from 20% to 25%. In group B, participants that reported consuming 1-3 servings of whole grains remained the same 40%, participants that reported consuming 4-6 servings of decreased from 60% to 0% and participants that reported consuming more than 6 servings increased from 0% to 60%.

In group A, participants that ate 0 meals away from home increased from 0% to 20%, 1-3 meals away from home increased from 40% to 60%, 4-10 meals away from home decreased from 60% to 20%, participants that ate 1-3 meals at fast food restaurants decreased from 80% to 20% and participants eating zero meals from fast food restaurants increased from 20% to 80%. Participants that reported using nutrition information to guide them on which foods to purchase, increased from 0% to 100%. Portion control and methods and physical activity change were described above. In group B, participants that ate 1-3 meals away from home increased from 40% to 60%, 4-10 meals away from home decreased from 60% to 40%, participants that ate 1-3 meals at fast food restaurants increased from 60% to 100% and participants eating more than 7 meals from fast food
restaurants decreased from 40% to 0%. Participants that reported using nutrition information to guide them on which foods to purchase, increased from 10% to 44%.

There was a significant change in nutrition knowledge scores across time (F = 29.531, p = .001), there was no significant difference between groups (F = 3.425 p = .101), and there was no interaction (F=.082, p = .782). Post treatment there was an increase in participants that were able to differentiate between essential fatty acids and lipids that contribute to heart disease such as saturated fat, cholesterol and trans fat. Participants were able to identify dietary sources of fiber, foods with added sugars, nutrient content of foods in the dairy, fats, and whole grains sections. Post treatment, participants were able to identify healthier snack options that were lower in fat and added sugars and higher in total nutrients. Post treatment participants demonstrated increased knowledge in the relationship diet has on preventable diseases such as salt and heart disease, sugar and diabetes, fats and heart health and diet as it relates to obesity. These positive findings in nutrition knowledge and improvements in behavior may lead to the prevention of lifestyle disease provided long-term adherence is achieved as relapse is often observed at one year and two year follow-up (Masheb et al., 2011).

Consumer Satisfaction Data

At the beginning of the study 55 % of participants responded >5 on the consumer satisfaction scale for behavior modification technique, “retrain your brain–learn new ways to reward yourself.” Post treatment 90% of participants responded >5 that this technique actually helped them change their behavior. At the beginning of the study 63 % of participants responded >5 on the consumer satisfaction scale for behavior modification technique, “set achievable goals.” Post treatment 60% of participants responded >5 that
this technique actually helped them change their behavior. At the beginning of the study 50% of participants responded >5 on the consumer satisfaction scale for behavior modification technique, “track your diet and physical activity.” Post treatment 67% of participants responded >5 that this technique actually helped them change their behavior. At the beginning of the study 88% of participants responded >5 on the consumer satisfaction scale for behavior modification technique, “recognize what events/situations lead you to overeat. Post treatment 60% of participants responded >5 that this technique actually helped them change their behavior. At the beginning of the study 88% of participants responded >5 on the consumer satisfaction scale for behavior modification technique, “discover methods to cope with stress.” Post treatment 44% of participants responded >5 that this technique actually helped them change their behavior. At the beginning of the study 88% of participants responded >5 on the consumer satisfaction scale for behavior modification technique, “believe in your ability to succeed.” Post treatment 78% of participants responded >5 that this technique actually helped them change their behavior. At the beginning of the study 17% of participants responded >5 on the consumer satisfaction scale for behavior modification technique, “connect with people that share your goals.” Post treatment 86% of participants responded >5 that this technique actually helped them change their behavior. At the beginning of the study 44% of participants responded >5 on the consumer satisfaction scale for behavior modification technique, “develop strategies that will prevent you from returning to your old habits.” Post treatment 60% of participants responded >5 that this technique actually helped them change their behavior. The findings of this pilot study provide input as to the efficacy of
several types of cognitive behavior techniques and may help in the design of future interventions geared toward weight management at the Nutrition Center.

Limitations of the Study

Limitations of this pilot study include the sample size, which limited the ability to find significant differences between the interventions. There was a great deal of interest in the study when advertised to the campus community however, once the interested applicants were contacted several of them failed to follow through. The questionnaires were self-administered and may have included over-reporters. The program was created in a way such that participants would learn certain elements one step at a time and so true changes may not have occurred at the time the study ended because there was not enough time to implement the changes to see significant results. Several participants noted that at the end of the study they felt secure in their ability to make the necessary changes and were excited to see the results once these changes had been applied over a greater period of time. The human element is another limitation, participants were asked not to use outside methods of weight loss during the initial assessment. Nonetheless, two of the participants in the email group used other methods of weight management (Fitbit). The activities were done in a group with the opportunity for open discussion; this setting may not have been the ideal learning environment for some of the participants.

Conclusions and Recommendations for Future Research

This pilot study served as the basis for the design and rationale of a weight management program to be offered at the University of Las Vegas, Nevada Nutrition Center. Findings of this study will provide the blueprint for future interventions and
continued research at the Nutrition Center. Recommendations for future research could be to follow these participants over time to determine if the changes demonstrated during the study were maintained. The addition of a support group at the end of the learning phase could also be studied. This could help to determine if participants need the additional time to implement changes as well as to provide the environment for participants to discuss how they are applying the information and what struggles need to be worked through so that the participants might have long-lasting success post treatment. This would however be a longer study and in such may complicate the recruitment of participants. Furthermore, implementation of this program to a larger sample size may result in greater differences between the groups. Analysis of the addition of a Fitbit device as the method for tracking diet, physical activity, and sedentary behavior could be examined, as the results provided by this device are more accurate and provide real time data for the participant. Subsequent research could be to focus more time on the techniques participants indicated had the greatest impact on behavior change and to examine whether an increase in time spent on these techniques result in more significant changes.
APPENDIX A: DIETARY AND PHYSICAL ACTIVITY BEHAVIORS

QUESTIONNAIRE

Q1 On average, how many servings of 100% PURE fruit juice did you have last week?

Do not include fruit-flavored drinks with added sugar r fruit juice you made at home and added sugar to. Only include 100% juice. Do not include fruit drinks with added sugar or other added sweeteners such as Kool-aid, Hi-C, lemonade, cranberry cocktail, Tampico, Sunny Delight, Snapple, Fruitopia, Gatorade, Power-Ade, or yogurt drinks.

- 0 servings
- 1-3 servings
- 4-6 servings
- 7-10 servings
- More than 10 servings

Q2 On average how many servings of fruit did you have last week? (not counting juice)

Examples include: apples, bananas, applesauce, oranges, grape fruit, fruit salad, watermelon, cantaloupe, honey dew, papaya, lychees, pomegranates, mangos, grapes, berries such as blueberries, raspberries, strawberries. Do not include dried fruit, fruit jam, jelly, or fruit preserves.

- 0 servings
- 1-3 servings
- 4-6 servings
- 7-10 servings
- More than 10 servings

Q3 On average, how many servings of cooked or canned beans, such as refried, baked, black, garbanzo beans, beans in soup, soybeans, edamame, tofu or lentils did you have?

Do NOT include long green beans.

- 0 servings
- 1-3 servings
- 4-6 servings
- 7-10 servings
- More than 10 servings
Q4 On average, how many servings of dark green vegetables for example broccoli or dark leafy greens including romaine, chard, collard greens, mustard greens, bok choy, turnip greens, or spinach? Include fresh, frozen, and canned.

- 0 servings
- 1-3 servings
- 4-6 servings
- 7-10 servings
- More than 10 servings

Q5 On average, how many servings of orange-colored vegetables such as sweet potatoes, pumpkin, winter squash, or carrots? Include fresh, frozen and canned.

- 0 servings
- 1-3 servings
- 4-6 servings
- 7-10 servings
- More than 10 servings

Q6 On average, how many servings of starchy foods such as white bread, white pasta, white rice, boxed cereal, flour tortillas?

- 0 servings
- 1-3 servings
- 4-6 servings
- 7-10 servings
- More than 10 servings

Q7 On average, how many servings of whole grains such as whole grain bread, whole grain pasta, brown rice, oatmeal, quinoa, whole grain wraps or corn tortillas?

- 0 servings
- 1-3 servings
- 4-6 servings
- 7-10 servings
- More than 10 servings
Q9 On average, how many meals (breakfast, lunch and dinner) did you eat that were prepared away from home in places such as restaurants, fast food places, food stands, grocery stores, or from vending machines during the past week?

- 0 servings
- 1-3 servings
- 4-6 servings
- 7-10 servings
- More than 10 servings

Q10 How many of those meals did you get from a fast-food or pizza place?

- 0
- 1-3
- 4-7
- More than 7

Q11 On average how many times did you eat “ready to eat” foods from the grocery store during the past week? Examples of “ready to eat” foods include salads, soups, chicken, sandwiches, and cooked vegetables in their salad bars and deli counters. Do not include sliced cheese or meat you use for making sandwiches.

- 0
- 1-3
- 4-7
- More than 7

Q12 During the last time when you ate our or bought food at a fast-food or pizza place, did you see nutrition or health information about any foods on the menu?

- Yes
- No
- Not sure

Q13 Did you use the information in deciding which foods to buy?

- Yes
- No
- Not sure
Q14 If nutrition or health information were readily available in fast food or pizza places, would you use it often, sometimes, rarely, or never, in deciding what to order?

- Often
- Sometimes
- Rarely
- Never

Q15 How often do you pay attention to portion sizes when you are eating?

- Often
- Sometimes
- Rarely
- Never

Q16 What methods of portion control do you use?

- Weigh/measure
- Compare or measure based on food models
- Plate method
- Guess portions
- No method

Q17 On average, how many servings of sugar sweetened beverages such as regular soda, sweet tea, sweetened juices do you have per week?

- 0 servings
- 1-3 servings
- 4-7 servings
- 7-10 servings
- More than 10 servings

Q18 In a typical week, do you walk or use a bicycle for at least 10 minutes continuously to get to and from places?

- Yes
- No
Q19 How much time do you spend walking or bicycling for travel on a typical day?

- 0 minutes
- 10-30 minutes
- 30-60 minutes
- More than 60 minutes

Q20 In a typical day, how many minutes do you spend doing vigorous-intensity sports, fitness, or recreational activities that cause large increases in breathing or heart rate like running or basketball for at least 10 minutes continuously?

- 0 minutes
- 10-30 minutes
- 30-60 minutes
- More than 60 minutes

Q21 In a typical day, how many minutes do you spend doing moderate-intensity sports, fitness, or recreational activities that cause a small increase in breathing or heart rate such as brisk walking, bicycling, swimming, or golf for at least 10 minutes continuously?

- 0 minutes
- 10-30 minutes
- 30-60 minutes
- More than 60 minutes
Q22 How much time do you usually spend sitting on a typical day? (do not include sleep time)

- 0-3 hours
- 4-7 hours
- 8-10 hours
- More than 10 hours

Q23 During the past week, on average how many hours per day did you sit and watch TV or videos?

- less than 1 hour
- 1-2 hours
- 3-5 hours
- More than 5 hours

Q24 During the past week, on average how many hours per day did you use a computer or play computer games outside of work or school? Include Playstation, Nintendo DS, Wii, or other portable games.

- less than 1 hour
- 1-2 hours
- 3-5 hours
- More than 5 hours

Q25 During the past week, on average how many hours per day did you play active video games such as Wii Sports, Wii fit, Xbox 360, Xbox kinect, Playsation 3, or Dance Dance Revolution?

- less than 1 hour
- 1-2 hours
- 3-5 hours
- More than 5 hours
Q26 Do you consider yourself to be

- Overweight
- Underweight
- About the right weight
- Don't know/Not sure

Q27 Would you like to weigh

- More
- Less
- Stay about the same

Q28 During the past 12 months, have you tried to lose weight?

- Yes
- No

Q29 How did you try to lose weight?

- Ate less food
- Switched to foods with lower calories
- Ate less fat
- Ate less carbohydrates
- Exercised
- Skipped meals
- Ate "diet" foods
- Used a liquid diet formula
- Took diet pills, medicine, or herbs (OTC or prescribed)
- Followed a special diet
- Other ____________________

Q30 How many times have you lost 10 pounds or more because you were trying to lose weight?

- 1 - 2
- 3 - 5
- 6 - 10
- More than 10
- Never
APPENDIX B: GENERAL NUTRITION KNOWLEDGE QUESTIONNAIRE

Q1 The first few items are about what advice you think experts are giving us. Do you think health experts recommend that people should be eating more, the same amount, or less of these foods? (check one box per food)

<table>
<thead>
<tr>
<th>Food</th>
<th>More</th>
<th>The Same</th>
<th>Less</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Sugary foods</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Meat</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Starchy foods</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Fatty foods</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>High fiber foods</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Fruit</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Salty foods</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Q2 How many servings of fruit and vegetables a day do you think experts are advising people to eat? (One serving could be, for example, an apple or a handful of chopped carrots)

- 1 to 3
- 3 to 5
- 5 or more
- Not sure

Q3 Which fat do experts say is most important for people to cut down on? (Select one)

- Monounsaturated fat
- Polyunsaturated fat
- Saturated fat
- Not sure

Q4 Experts classify foods into groups. We are interested to see whether people are aware of what foods are in these groups. Do you think these are high or low in added sugar? (check one box per food)

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Low</th>
<th>Not sure</th>
</tr>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Plain yogurt</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Ice-cream</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Squash</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Tomato Ketchup</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Canned fruit in natural juice</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Q5 Do you think these are high or low in fat? (check one box per food)

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Low</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasta (without sauce)</td>
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<td>○</td>
<td></td>
</tr>
<tr>
<td>Low fat spread</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Baked beans</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Luncheon meat</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Honey</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Nuts</td>
<td>○</td>
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<td></td>
</tr>
<tr>
<td>Bread</td>
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<td>○</td>
<td></td>
</tr>
<tr>
<td>Cottage cheese</td>
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<td>○</td>
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<tr>
<td>Polyunsaturated margarine</td>
<td>○</td>
<td>○</td>
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</tr>
</tbody>
</table>
Q6 Do you think experts put these in the grains foods group? (check one box per food)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
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<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Pasta</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Butter</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Nuts</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Rice</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Cereal</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
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</tbody>
</table>

Q7 Do you think these are high or low in salt? (check one box per food)

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Low</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sausages</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Pasta</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Canned fish</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Red meat</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Frozen vegetables</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
</tr>
<tr>
<td>Cheese</td>
<td>♡</td>
<td>♡</td>
<td>♡</td>
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</tbody>
</table>
Q8 Do you think these foods are high or low in protein? (check one box per food)

<table>
<thead>
<tr>
<th>Food</th>
<th>High</th>
<th>Low</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Cheese</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Fruit</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Beans</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Butter</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Cream</td>
<td>☐</td>
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</tbody>
</table>

Q9 Do you think these foods are high or low in fiber/roughage? (check one box per food)

<table>
<thead>
<tr>
<th>Food</th>
<th>High</th>
<th>Low</th>
<th>Not sure</th>
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</thead>
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<tr>
<td>Cornflakes</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Bananas</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Eggs</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Red meat</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Broccoli</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Nuts</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Food</td>
<td>High</td>
<td>Low</td>
<td>Not sure</td>
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<td>-----------------------------</td>
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</tr>
<tr>
<td>Fish</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Baked potato w/ skin</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Chicken</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Beans</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Mackerel</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Whole milk</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Olive oil</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Red meat</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Sunflower margarine</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Chocolate</td>
<td>☐</td>
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<td>☐</td>
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</tbody>
</table>

Q10 Do you think these fatty foods are high or low in saturated fat? (check one box per food)
Q11 Some foods contain a lot of fat but no cholesterol

☐ Agree  ☐ Disagree  ☐ Not sure

Q12 Do you think experts call these a healthy alternative to red meat?

<table>
<thead>
<tr>
<th>Food</th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tofu</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
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<tr>
<td>Luncheon meat</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>Beans</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>Nuts</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>Low fat cheese</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>Quiche</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
</tbody>
</table>

Q13 A glass of unsweetened fruit juice counts as a helping of fruit

☐ Agree  ☐ Disagree  ☐ Not sure
Q14 Saturated fats are mainly found in (check one):

- Vegetable oils
- Dairy products
- both (a) and (b)
- Not sure

Q15 Brown sugar is a healthy alternative to white sugar

- Agree
- Disagree
- Not sure

Q16 There is more protein in a glass of whole milk than in a glass of skimmed milk

- Agree
- Disagree
- Not sure

Q17 Polyunsaturated margarine contains less fat than butter

- Agree
- Disagree
- Not sure

Q18 Which of these breads contain the most vitamins and minerals? (check one)

- White
- Brown
- Whole grain
- Not sure

Q19 Which do you think is higher in calories? (check one)

- Butter
- Margarine
- Both the same
- Not sure
Q20 A type of oil which contains mostly monounsaturated fat is: (check one)
- Coconut oil
- Sunflower oil
- Olive oil
- Palm oil
- Not sure

Q21 There is more calcium in a glass of whole milk than a glass of skim milk
- Agree
- Disagree
- Not sure

Q22 Which one of the following has the most calories for the same weight? (check one)
- Sugar
- Starchy foods
- Fiber
- Fat
- Not sure

Q23 Harder fats contain more: (check one)
- Monounsaturated fat
- Polyunsaturated fat
- Saturated fat
- Not sure

Q24 Polyunsaturated fats are mainly found in: (check one)
- Vegetable oils
- Dairy products
- Both (a) and (b)
- Not sure
Q25 The next few items are about choosing foods

Please answer what is being asked and not whether you like or dislike the food! For example, suppose you were asked ...."If a person wanted to cut down on fat, which cheese would be best to eat?"

(a) cheddar cheese
(b) brie
(c) cottage cheese
(d) cream cheese

If you didn't like cottage cheese, but knew it was the right answer, you would still check cottage cheese. Which would be the best choice for a low fat, high fiber snack?

- Diet strawberry yogurt
- Raisins
- Museli bar
- Whole wheat crackers and cheddar cheese

Q26 Which would be the best choice for a low fat, high fiber light meal? (check one)

- Grilled chicken
- Cheese on whole wheat toast
- Beans on whole wheat toast
- Quiche

Q27 What kind of sandwich do you think is healthier? (check one)

- Two thick slices of bread with a thick slice of cheddar cheese filling
- Two thin slices of bread with a thick slice of cheddar cheese filling

Q28 Many people eat spaghetti Bolognese (pasta with a tomato and meat sauce). Which do you think is healthier? (check one)

- A large amount of pasta with little sauce on top
- A small amount of pasta with a lot of sauce on top
Q29 If a person wanted to reduce the amount of fat in their diet, which would be the best choice? (check one)

- Steak, grilled
- Sausages, grilled
- Turkey, grilled
- Pork chop, grilled

Q30 If a person wanted to reduce the amount of fat in their diet, but didn't want to give up chips, which one would be the best choice? (check one)

- Thick cut chips
- Thin cut chips
- Crinkle cut chips

Q31 If a person felt like something sweet, but was trying to cut down on sugar, which would be the best choice? (check one)

- Honey on toast
- A cereal snack bar
- Plain Biscuit
- Banana with plain yogurt

Q32 Which of these would be the healthiest pudding? (check one)

- Baked apple
- Strawberry yogurt
- Whole wheat crackers and cheese
- Carrot cake with cream cheese topping

Q33 Which cheese would be the best choice as a lower fat option? (check one)

- Plain cream cheese
- Mozzarella
- Cheddar
- Brie

Q34 If a person wanted to reduce the amount of salt in their diet, which would be the best choice? (check one)

- Readymade frozen shepherd's pie
Ham with pineapple
Mushroom omelets
Stir fry vegetables with soy sauce

Q35 This section is related to health problems or diseases.

Are you aware of any major health problems or diseases that are related to a low intake of fruit and vegetables?

☐ Yes
☐ No
☐ Not sure

If Yes Is Selected
Q36 What diseases or health problems do you think are related to a low intake of fruit and vegetables?

Q37 Are you aware of any major health problems or diseases that are related to a low intake of fiber?

☐ Yes
☐ No
☐ Not sure

If Yes Is Selected
Q38 What diseases or health problems do you think are related to fiber?

Q39 Are you aware of any major health problems or diseases that are related to how much sugar people eat?

☐ Yes
☐ No
☐ Not sure

If Yes Is Selected
Q40 What diseases or health problems do you think are related to sugar?
Q41 Are you aware of any major health problems or diseases that are related to how much salt people eat?

- Yes
- No
- Not sure

If Yes Is Selected
Q42 What diseases or health problems do you think are related to salt?

Q43 Are you aware of any major health problems or diseases that are related to the amount of fat people eat?

- Yes
- No
- Not sure

If Yes Is Selected
Q44 What diseases or health problems do you think are related to fat?

Q45 Do you think these help to reduce the chances of getting certain cancer? (answer each one)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating more fiber</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
</tr>
<tr>
<td>Eating less sugar</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
</tr>
<tr>
<td>Eating less fruit</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
</tr>
<tr>
<td>Eating less salt</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
</tr>
<tr>
<td>Eating more fruits and vegetables</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
</tr>
<tr>
<td>Eating less preservatives/additives</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
</tr>
</tbody>
</table>
Q46 Do you think these help prevent heart disease?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating more fiber</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Eating less saturated fat</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Eating less salt</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Eating more fruits and vegetables</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Eating less preservatives/additives</td>
<td>☐</td>
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</tr>
</tbody>
</table>

Q47 Which one of these is more likely to raise people's blood cholesterol level? (check one)

- ☐ Antioxidants
- ☐ Polyunsaturated fats
- ☐ Saturated fats
- ☐ Cholesterol in the diet
- ☐ Not sure

Q48 Have you heard of antioxidant vitamins?

- ☐ Yes
- ☐ No

If Yes Is Selected
Q49 Do you think these are antioxidant vitamins?

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>B Complex Vitamins</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Vitamin E</td>
<td>●</td>
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<td>●</td>
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<tr>
<td>Vitamin E</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Vitamin K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

Q50 Finally, we would like to ask you a few questions about yourself

Are you male or female?

▫ Male
▫ Female

Q51 How old are you

▫ Less than 18
▫ 18-24
▫ 25-34
▫ 35-44
▫ 45-54
▫ 65-74
▫ more than 75
Q52 Are you:
- Single
- Married
- Living as married
- Separated
- Divorced
- Widowed

Q53 What is your ethnic origin?
- White
- Black Caribbean
- Black African
- Black other
- Indian
- Pakistani
- Bangladeshi
- Chinese
- Asian
- Hispanic
- Other ____________________

Q54 Do you have any children?
- No
- 1
- 2
- 3
- 4
- More than 4

Q55 Do you have any children, under 18 years, living with you?
- Yes
- No
Q56 What is the highest level of education you have completed?

- Elementary school
- High school
- Some college
- College degree
- Post-graduate degree

Q57 Do you have any health or nutrition related qualifications?

- Yes ____________________
- No

Q58 What is your job? If not working now, what is your usual job? (please be specific)

Q59 If you have a partner, what is his/her job? If he/she is not working now, what is his/her usual job? (please be specific)

Q60 Are you currently

- Employed full time
- Employed part time
- Unemployed
- Full time homemaker
- Retired
- Student
- Disabled or too ill to work

Q61 Are you on a special diet?

- Yes ____________________
- No

Q62 The END

Thank you very much for your time. If there are any comments you would like to make about this questionnaire, please do so below, they would be very welcome
APPENDIX C: CONSUMER SATISFACTION SURVEYS

Consumer satisfaction survey – pre treatment

Q1 On the scale below, please indicate how useful you believe the following tool would be to you. Retrain your brain -learn healthy ways to reward yourself.

1 2 3 4 5 6 7

Q2 On the scale below, please indicate how useful you believe the following tool would be to you. Set achievable goals.

1 2 3 4 5 6 7

Q3 On the scale below, please indicate how useful you believe the following tool would be to you. Track your diet & physical activity.

1 2 3 4 5 6 7

Q4 On the scale below, please indicate how useful you believe the following tool would be to you. Recognize what events/situations lead you to overeat.

1 2 3 4 5 6 7

Q5 On the scale below, please indicate how useful you believe the following tool would be to you. Discover methods to cope with stress.

1 2 3 4 5 6 7

Q6 On the scale below, please indicate how useful you believe the following tool would be to you. Believe in your ability to succeed

1 2 3 4 5 6 7
Q7 On the scale below, please indicate how useful you believe the following tool would be to you. Connect with people that share your goals.

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<table>
<thead>
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</thead>
</table>
1 2 3 4 5 6 7

Q8 On the scale below, please indicate how useful you believe the following tool would be to you. Develop strategies that will prevent you from returning to your old habits.

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</table>
1 2 3 4 5 6 7

Consumer satisfaction survey – post treatment

Q1 On the scale below, please indicate how useful the following tool was to you. Retrain your brain - learn healthy ways to reward yourself.

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<th></th>
</tr>
</thead>
</table>
1 2 3 4 5 6 7

Q2 On the scale below, please indicate how useful the following tool was to you. Set achievable goals.

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</thead>
</table>
1 2 3 4 5 6 7

Q3 On the scale below, please indicate how useful the following tool was to you. Track your diet & physical activity.

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</thead>
</table>
1 2 3 4 5 6 7

Q4 On the scale below, please indicate how useful the following tool was to you. Recognize what events/situations lead you to overeat.

<p>| | | | | | | |</p>
<table>
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<th></th>
<th></th>
</tr>
</thead>
</table>
1 2 3 4 5 6 7
Q5 On the scale below, please indicate how useful the following tool was to you. Discover methods to cope with stress.

1 2 3 4 5 6 7

Q6 On the scale below, please indicate how useful the following tool was to you. Believe in your ability to succeed

1 2 3 4 5 6 7

Q7 On the scale below, please indicate how useful the following tool was to you. Connect with people that share your goals.

1 2 3 4 5 6 7

Q8 On the scale below, please indicate how useful the following tool was to you. Develop strategies that will prevent you from returning to your old habits.

1 2 3 4 5 6 7
Slide 1

Slide 2

Nutrition Education Series – Nutrients

Eating foods that supply appropriate amounts of essential nutrients

Healthy Eating

Eating foods that supply appropriate amounts of essential nutrients
Nutrient Classification

Six classes of Nutrients
- Carbohydrate
- Water
- Protein
- Vitamins
- Fat
- Minerals

Nutrient Classification

Energy Nutrients
- Carbohydrate (4 kcal/g) - Fuel
- Fat (9 kcal/g) - Fuel
- Protein (4 kcal/g) - Tissue maintenance and repair, Minor fuel source
- Vitamins & Minerals - Coenzymes in Energy Metabolism
Carbohydrates serve vital functions for overall health. They are the primary and preferred fuel of all muscle movement. For your brain and central nervous system, carbohydrates are indispensable. Carbohydrates cross over several food groups—breads, cereals, pasta, grains, fruits, juices, vegetables, milk, legumes and sweets. Carbohydrates provide energy and most also provide nutrients and fiber to our diets.

Glucose and fructose may occur alone such as in fruit, however most sugars are found in pairs. Sucrose is the substance most people refer to as table sugar. Sucrose is also found in cane sugar, brown sugar, maple syrup, corn syrup, high fructose corn syrup, molasses, and many fruits. It is also added to many foods. Lactose is the carbohydrate form that is found in milk and dairy products (yogurt, cheese, sour cream, ice cream). If you are lactose intolerant, you lack the enzyme needed to break apart glucose and galactose, therefore you can’t digest milk and other dairy products. Maltose does not contribute much to the diet. It is found in sprouted grains and the malt found in beer. Starch is a long chain of glucose, it is found in bread, cereal, pasta, grains, and some vegetables—peas, corn, potatoes.
Carbohydrate Classification

◊ Complex Carbohydrates
 Starch vs. fiber
 Whole grain vs. Processed grains

◊ Simple carbohydrates
 Sugars
 Milk
 Fruit

The fact that a food is a complex carbohydrate does not influence in and of itself, how quickly or slowly it is digested nor does it speak to the food’s nutritional value. For example fruits are simple carbohydrates since they contain either mono or disaccharides and yet are among the most nutrient-rich foods available. Table sugar on the other hand, another simple sugar, does not provide any nutrients, only calories. All starches are complex carbohydrates, even if they are highly processed, such as white bread. However, there is a nutritional difference between complex carbohydrates that are refined or highly processed versus whole grains and less processed foods.

Bran: found in the outer layers of a grain, contains most of the grain’s fiber and some b vitamins
Germ: nutrient rich part of the grain, contains antioxidants, vitamin E, b-vitamins; each grain has a different line up of nutrients – variety is important!
Endosperm: starchy inner part of a grain, contains carbs and protein.

Enriched means some of the nutrients that were removed during processing are added back in: thiamin, riboflavin, niacin, iron, and folic acid.

Main goal is for the majority of your intake to come from foods providing beneficial nutrients with less emphasis on foods that have had nutrients removed or unhealthy ingredients added.
### Fiber

Component of some carbohydrate-containing foods that cannot be digested or absorbed in our intestinal tracts. There are two types of fiber: insoluble and soluble.

**Insoluble fiber:**
- Found in outer layer of grains and gives plants their structure. Ex: wheat bran, nuts, broccoli, asparagus, carrots, spinach. Cannot be dissolved in water, remains bulky, can help keep you full longer and can prevent or alleviate constipation.

**Soluble fiber:**
- Found in oatmeal, barley, legumes, citrus fruits, berries, apples, pears, Brussels sprouts, potatoes. Can be dissolved in water, adds thickness or viscosity.

Fiber is an important part of our diet because it helps keep the intestines healthy. High fiber foods also help control hunger and stabilize glucose levels in the blood, thus helping to control diabetes and other digestive conditions.

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Fiber is an important part of our diet because it helps keep the intestines healthy. High fiber foods also help control hunger and stabilize glucose levels in the blood, thus helping to control diabetes and other digestive conditions.
A diet rich in fruits may reduce the risk of diseases, such as stroke, heart disease, type 2 diabetes, and cancers (mouth, stomach, and colon-related).

- Fruits can aid in weight management. Most fruits are naturally low in fat and calories.
- Fruits are good sources of potassium, which helps to maintain healthy blood pressure and may reduce the risk of bone loss and development of kidney stones.

Most of us know that bananas are a good source of potassium, but did you know that dried plums (prunes), cantaloupe, honeydew melon, dried peaches and apricots, and orange juice are too?

- Fruits are good sources of dietary fiber. The fiber found in fruits may help reduce blood cholesterol and a number of beneficial effects including decreased risk of coronary artery disease. Dietary fiber improves bowel function. Fruit juices contain little or no fiber, however.

Many fruits contain vitamin C, which aids in the growth and repair of all body tissues. It helps heal cuts and wounds and keeps the teeth and gums healthy.

- Vitamin A found in fruits keeps eyes and skin healthy and helps to protect against infections.
- The folic acid in fruits helps the body form red blood cells. It is also very important to pregnant women because it reduces the risk of neural tube defects and other birth defects.

- Additionally, fruits are naturally low in sodium and do not contain cholesterol.

While the nutrition of fruits is very important, the flavor and pleasure fruits add to our diets each day is equally important.
Fruits are naturally sweet and make a welcome addition to any meal. Fruits are very versatile on the menu. They can be served as a separate menu item or combined with other ingredients in salads, side dishes, baked items, and even as part of entrees. Fruits can show up as major ingredients in soups and sauces as well. Fruits also make excellent snacks and many don’t require any preparation. Most can be eaten out of hand, peel and all—just rinse, eat, and enjoy! (My plate tip sheets, ODS)
Eating vegetables provides many health benefits.
• A diet rich in vegetables may reduce the risk of diseases such as stroke, heart disease, type 2 diabetes, and cancers (mouth, stomach, and colon-related).
• Low-calorie vegetables can aid in weight management.
• Potassium found in vegetables may reduce the risk of kidney stones and bone loss.
• High-fiber vegetables may reduce blood cholesterol and improve bowel function.
• Vegetables containing vitamin A help to keep the eyes and skin healthy and protect against infection.
• Vitamin E helps to protect vitamin A and essential fatty acids from cell oxidation.
• Vitamin C helps heal cuts and wounds and keeps teeth and gums healthy. Vitamin C also aids in iron absorption. For pregnant women, the consumption of folic acid found in vegetables helps prevent neural tube defects in babies. (Office of Dietary Supplements)
A diet rich in a medley of phytonutrients is a lower risk for diseases such as heart disease and cancer. Each individual color in a fruit or vegetable means a different set of phytonutrients, each with its own unique function. For example, orange- and yellow-colored vegetables such as carrots, butternut squash and sweet potatoes are overflowing with beta-carotene, a carotenoid antioxidant that the human body can convert to vitamin A, which helps improve immune, reproductive and bone health (Office of Dietary Supplements). Their counterparts in the fruit department, including oranges and mangoes, are brimming with vitamin C, a supercharged antioxidant that can help reduce blood pressure numbers (Jurashcek et al., 2012). Red-tinged tomatoes, watermelon and pink grapefruit possess the phytonutrient lycopene, which has been recognized for its anti-cancer efficacy (Sharoni et al., 2012). Anthocyanin phochemicals found in blue and purple options such as blueberries and plums may help endothelial function. Leafy vegetables in the green color scheme such as kale and Swiss chard deliver lutein and zeaxanthin, these contribute to eye health by diminishing the risk of conditions such as macular degeneration (Kelsey et al., 2011). The color white is also powerful. Foods like mushrooms have compounds thought to boost immune health, while garlic and onions possess allicin—an antioxidant with strong anti-bacterial properties (Kim et al., 2012).
The intake of dairy products is especially important to bone health during childhood and adolescence, when bone mass is being built. Calcium is used for building bones and teeth and in maintaining bone mass. Diets that provide 3 cups or the equivalent of dairy products per day can improve bone mass (Mahan, L. K. et al 2012 and Gropper, S.A. et al 2009, Office of Dietary Supplements).

Diets rich in potassium may help to maintain healthy blood pressure. Dairy products, especially yogurt, fluid milk, and soymilk (soy beverage), provide potassium.

Vitamin D functions in the body to maintain proper levels of calcium and phosphorous, thereby helping to build and maintain bones. Milk and soymilk (soy beverage) that are fortified with vitamin D are good sources of this nutrient. Other sources include vitamin D-fortified yogurt and vitamin D-fortified ready-to-eat breakfast cereals.

Milk products that are consumed in their low-fat or fat-free forms provide little or no solid fat.
Choosing foods from the Dairy Group that are high in saturated fats and cholesterol can have health implications. Diets high in saturated fats raise "bad" cholesterol levels in the blood. The "bad" cholesterol is called LDL (low-density lipoprotein) cholesterol. High LDL cholesterol, in turn, increases the risk for coronary heart disease. Many cheeses, whole milk, and products made from them are high in saturated fat. To help keep blood cholesterol levels healthy, limit the amount of these foods you eat. In addition, a high intake of fats makes it difficult to avoid consuming more calories than are needed (Mahan, L. K. et al 2012 and Gropper, S.A. et al 2009). Discuss how group uses dairy foods and find healthy substitutions.
What is Protein?

- All proteins are made up of amino acids
  They are molecules (building blocks), composed of carbon, hydrogen, oxygen, nitrogen, & sometimes sulfur.
- There are 20 different amino acids in nature
  They combine in various ways to form the different proteins needed by the body
  - Essential amino acids
  - Non-essential amino acids
  - Branched chain amino acids

Proteins in our body are created from the dietary protein that we consume from food. Dietary proteins are digested and broken down into their component parts, amino acids. These amino acids are then put back together by and within our bodies, just like pieces of a puzzle, to create different proteins our bodies need to function.

The three branched chain amino acids – leucine, isoleucine, and valine bypass the liver and go straight to the periphery (muscles located away from the core) they can also be used as an energy source or for repair, maintenance, or building muscle tissue.

There are 9 essential and 11 non essential amino acids. Essential means we must get them through food because our bodies do not make them. The other 11 are present in food but can also be made inside the body (Mahan, et al., 2012 and Gropper, et al., 2009).

Protein's Role In Body Structures

- Muscles are made of protein
  Only 15 to 20 percent of your muscles are made of protein, the rest is water, stored carbohydrate, fat, and minerals. Protein is needed for:
  - Muscle repair and building
  - Hypertrophy
  - Performance
- Proteins comprise other structures in the body including
  - Heart
  - GI tract
  - Tendons & Ligaments
  - Collagen
  - Skin, Hair, Nails
What is Protein?
Protein's Role In Bodily Functions

- Proteins are part of metabolic, hormonal, immune, and transport systems. They carry out these vital functions:
  - Form red blood cells
  - Form hormones
  - Create enzymes
  - Help regulate fluid balance
  - Regulate the acid and base quality of body functions
  - Create antibodies

1. Form red blood cells, known as hemoglobin, which transports oxygen in blood, and myoglobin, which transports oxygen in muscles.
2. Form hormones, which are substances that cause an effect or change the activity of another cell.
3. Create enzymes, which are “helper” substances that cause or help a chemical reactions to take place, including metabolism, and the storage and usage of dietary carbohydrate, protein, and fat.
4. Help regulate fluid balance by directing where fluids are kept inside the body. Proteins serve as a pump that moves particles into or out of a cell, and fluid then follows.
5. Regulate the acid and base quality of body fluids. For example if a fluid, such as blood, becomes more alkaline or acidic than the body tolerates, proteins may be used as a buffer to bring the pH to the required level.
6. Create antibodies, which are substances that attack invaders in our bodies, thereby helping the immune system (Mahan et al., 2012 and Gropper et al., 2009).
Protein Classification

Complete Proteins
- Complete proteins contain all the essential amino acids in the proportions needed by the body.
- Only animal-derived proteins are complete.
- Soy is the only complete plant protein.

Incomplete Proteins
- Incomplete proteins lack one or more essential amino acids.
- Most plant proteins are incomplete.
- To be complete, plant proteins need to be combined with other incomplete proteins to provide all essential amino acids.

The body breaks down dietary protein and creates an amino acid "pool" inside the body. As long as all essential amino acids are consumed within a 24-hr period, the body will take amino acids from the pool to create structural or functional proteins as needed. For example, kidney beans are low in methionine, rice contributes enough methionine to form a complete protein; if you eat them together you will have made a complete protein (Mahan et al., 2012 and Gropper et al., 2009).
Why do we need fat?

Fat’s Role In Bodily Functions
• Fat serves vital functions in your health and exercise regime. Dietary fat is not only necessary for providing energy but also for:
  - Production of hormones
  - Estrogen, Progesterone, Adrenocortical
  - Absorption of nutrients
  - Vitamins A, D, E, and K
  - Keep our hearts healthy
  - Mono & Polyunsaturated fats
  - Prevent Inflammation
  - Omega-3 Fatty Acids

Describe the relationship between essential fat and health.

A diet too low in fat can be detrimental to health
• Without enough estrogen, females’ menstrual cycles are interrupted which can have a severely negative impact on bone health, resulting in stress fractures.
• Without adequate calories and dietary fat, males may not manufacture enough testosterone, which can inhibit muscle development, growth, and bone health.
• Fats are used to formulate eicosanoids—these hormone-like substances affect inflammation, blood pressure, thickness of blood.
• Fats are part of cell membranes and nerve sheaths.
• Fat protects and insulates our vital organs.

(Mahan, et al., 2012 and Gropper, et al., 2009).
Types of Dietary Fats & Oils

◊ Saturated fats typically are solid at room temperature because they contain higher amounts of hydrogen.

The main sources of saturated fat in the typical American diet are foods from animals (whole milk, cream, ice cream, whole milk cheeses, butter, lard, visible fat on meats) and some plant oils (palm, palm kernel and coconut oils, cocoa butter).

◊ Trans fats are common in a wide range of foods made with partially hydrogenated oils, such as baked goods, fried foods, and some margarine products. Through the process of hydrogenation, unsaturated fatty acids can be made more saturated, which converts a liquid fat into a stable liquid or semisolid form.

Trans fats can be found naturally in low amounts in meats and dairy products.

◊ Oils are a liquid form of fat and contain larger amounts of unsaturated fatty acids, which are liquid at room temperature. Some examples are cooking oils such as canola, corn, and soybean oil.

◊ Polyunsaturated fats are found in plant foods such as corn, safflower, sunflower, sesame oils, nuts, and seeds. Some examples are walnuts, flaxseeds, and pumpkin seeds.

◊ Monounsaturated fats are found in plant foods such as canola, peanut, and olive oils, nuts, and avocados.

The fat in meats (beef, pork, and poultry) is made of monounsaturated and saturated fatty acids.

◊ Sterols are substances present in the fatty tissue of plants and animals. Different sterols have different effects on the body. Cholesterol, the most common sterol, is vital to our well-being; it is necessary to form steroids in the body (estrogen, androgen, progesterone, adrencortical hormones, bile, and vitamin D). Cholesterol is also in the membranes of all cells in our bodies.

Saturated fats and trans fats raise blood cholesterol. A high level of cholesterol increases unhealthy blood lipids (low-density lipoproteins, or LDL cholesterol). A high level of LDL and total cholesterol in the blood is a major risk factor for coronary heart disease (heart attacks, stroke). It is important to check nutrition facts labels and ingredient lists on similar foods.

The Dietary Guidelines for Americans 2010 recommendation is to limit fats not to exceed 30% of the total daily caloric intake. Only 10% of those calories should be from saturated fat and the other 20% should be divided between monounsaturated and polyunsaturated fat. (Mahan, et al., 2012 and Gropper, et al., 2009).

Guidelines

◊ Consume less than 10 percent of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.

◊ Keep trans fatty acid consumption as low as possible.

◊ Replace protein foods that are higher in solid fats and calories with choices that are lower in solid fats and calories and/or are sources of oils.

◊ Use oils to replace solid fats where possible.
Vitamins and minerals are naturally found in food but also found in supplement form as in powders, water, pills, protein bars and shakes. Vitamins cannot be made by the body and so must be consumed. We need vitamins and minerals as well as antioxidants and phytonutrients for health and well-being.

Vitamins and minerals play several roles in the proper functioning of our body. For optimal health nutrients should be replaced on a daily basis. Although we won’t become deficient in one day our bodies do need these nutrients and use them on a daily basis in order to function properly. Additionally micronutrients are best absorbed in small quantities throughout the day rather than in one big dose (Mahan et al., 2012 and Gropper et al., 2009).
Vitamins & minerals

Vitamin & Minerals are Found in Food

- Food supplies vitamins, minerals, and antioxidants in the appropriate amounts.
- Vitamins, minerals, and antioxidants work synergistically.
- Foods supply the correct amount your body needs.
- Some supplements can have such high amounts that over time these can become toxic.
- Quantity does not equal quality.
- Supplements contain some but not all nutrients.
- We just have not identified all of these.
- Fruits, vegetables, and whole grains provide phytochemicals.
- Isolated forms (supplements) have been shown to be toxic.

Overfed but undernourished – you can be eating enough calories but you may be malnourished because of the lack of nutrients in the food you choose. Ex: a pound of sugar will supply you with energy but nothing more. When calories, calcium, vitamin D, protein or fat intake is too low, stress fractures can occur. Iron deficient diets impair oxygen carrying capacity of blood. Lack of vitamin C may impair wound healing.

Essential Vitamins

- B-vitamins support energy metabolism, nerve function, digestive system, DNA formation, vision and skin health.
- Vitamin A supports vision, skin, bones and teeth, supports immune function, and reproductive health.
- Vitamin E is an antioxidant, regulates metabolism, helps with absorption and digestion.
- Vitamin C supports immune function, wound healing, and collagen synthesis.
- Vitamin D supports bone health and calcium metabolism.
- Vitamin K is needed for the synthesis of blood clotting proteins, supports blood calcium homeostasis.
Sodium: maintains fluid and electrolyte balance, supports muscle contraction and nerve impulse transmission.

Potassium: maintains fluid and electrolyte balance, cell integrity, muscle contractions and nerve impulse transmission, helps transport glucose into muscle cells and glycogen storage.

Phosphorus: formation of cells, bones and teeth, maintains acid-base balance.

Chloride: maintains fluid and electrolyte balance, aids in digestion.

Calcium: formation of bones and teeth, supports blood clotting, blood pressure, necessary for muscle contraction, nerve transmission and glandular secretions.

Magnesium: supports bone mineralization, protein building, muscular contraction, nerve impulse transmission.

Essential Minerals

Iron: as part of hemoglobin, carries oxygen throughout the body.

Selenium: antioxidant, protects the body's cells from oxidation, regenerates vitamin C.

Copper: necessary for the absorption and utilization of iron, supports formation of hemoglobin and several enzymes, needed for collagen synthesis and for creating connective tissue.

Zinc: part of many enzymes, involved in production of genetic material, protein synthesis and breakdown, transports vitamin A, supports wound healing, reproductive health, development of the fetus.

Iodine: component of thyroid hormones that help regulate growth, development and metabolic rate, plays a role in protein synthesis.

Manganese: facilitates many cell processes.

As you can see vitamins, minerals, and phytonutrients are essential for good. Nutrients work together to keep us healthy, and many body functions are interdependent. To get the most out of your body, get the most out of your food. Choose nutrient-rich foods that will provide an array of vitamins, minerals, and phytonutrients for the foundation of your diet. A multivitamin doesn’t make up for a nutrient poor diet because all the beneficial substances we find in food cannot be found in one pill.
Questions?

THANK YOU!
“Lack of activity destroys the good condition of every human being, while movement and methodical physical exercise save and preserve it.”

- Plato
Benefits of physical activity

- Improve quality of life
- Reduce the risk of chronic disease
  - Coronary Artery Disease
  - Hypertension
  - Some Cancers
  - Type 2 Diabetes
- Enhance one’s mental well-being
- Promote healthy musculoskeletal function throughout life

Being physically active may produce these results.
(Physical Activity Guidelines for Americans 2008)
**Slide 5**

**Diabetes, Insulin Sensitivity & Glucose Metabolism**

- Affects 170 million individuals worldwide
- Largely due to inactivity and obesity
- Physical inactivity weakens the body’s insulin regulatory mechanisms
- Regular aerobic activity increases insulin sensitivity and glucose metabolism
- Resistance training improves glucose metabolism

Health benefits of Physical Activity

**Slide 6**

**Hypertension**

- Elevated blood pressures are associated with a higher risk of developing CHD, CHF, & kidney failure
- Moderate-intensity aerobic exercise 3-5 times per week for 30-60 min is an effective way to manage hypertension
- Habitual aerobic exercise plays a protective role against the increase in blood pressure associated with aging
- Circuit training vs. weight training

Moderate-intensity aerobic exercise (40%-50% of VO2max), performed three to five times per week for a 30 to 60 minute session appears to be effective in blood pressure reduction (when elevated). Although routine aerobic exercise usually will not affect the blood pressure of normotensive individuals, habitual aerobic exercise may be protective against the increase in blood pressure commonly seen with increasing age (Fagard, 2001). Studies in hypertensive men and women included a reduction in systolic blood pressure by an average of 3.84 mmHg and 2.58 mmHg for diastolic blood pressure. During resistance exercise, systolic and diastolic blood pressures may show steep increases, which indicates that caution should be observed with persons with known cardiovascular disease or risk factors.
factors. These increases in blood pressure are dependent on the intensity of the contraction, the length of time the contraction is held, and the amount of muscle mass involved in the contraction.

More dynamic forms of resistance training, such as circuit training, that involve moderate resistance loads and high repetitions with short rests are safe and associated with reductions in blood pressure (Cornelisen, 2005).

It is well established that a sedentary lifestyle contributes significantly to the development of CHD and unfavorable elevation of blood fats and cholesterol levels; physical activity plays an important role in decreasing these health risks. 15 to 20 miles/week of jogging or brisk walking, which is equivalent to 1200 to 2200 kilocalories of energy expenditure, may decrease blood triglycerides by 5 to 38 mg/deciliter (Durstine et al., 2002). That same amount of exercise (15 to 20 miles/week of jogging or brisk walking) has been shown to elevate HDL-C (a positive alteration) 2 to 8 mg/deciliter. The serum level of LDL-C has been shown to be significantly reduced among women (a decrease of 14.5 +/- 22.2 mg per deciliter) and men (a decrease of 20.0 +/- 17.3 mg/deciliter) randomly assigned to a diet-plus-exercise group.
Health benefits of Physical Activity

Slide 8

- Cancer
  - Physical activity & exercise are correlated with lower incidence of colon cancer and breast cancer
  - 30-60 minutes of moderate physical activity results in up to a 40% reduction relative risk of cancer compared to inactive counterparts
  - Physically active individuals may also have a lower risk of lung cancer

Health benefits of Physical Activity

Slide 9

- Osteoporosis
  - Degenerative disease \(\rightarrow\) loss of BMD \(\rightarrow\) bone fractures and health problems
  - Physical activity stimulates bone growth
  - Resistance training and weight bearing aerobic exercise may provide the stimulus for bone formation
  - Regular weight-bearing activity is effective at averting age-related bone loss
  - Weight-bearing aerobic exercises \(\times\) a wk. \(\times\) a wk. preserves bone health during adulthood

With osteoporosis, a degenerative disease characterized by a loss of bone mineral density resulting in a susceptibility to bone fractures and health problems, it appears resistance training and weight bearing aerobic exercise may provide the needed stimulus for bone formation. Exercise programs to maintain and increase bone growth should be full-body in nature, including exercises such as squats and lunges, which direct the forces through the axial skeleton and allow for greater loads to be utilized. In addition, evidence does suggest that moderate weight-bearing activity, such as brisk walking done regularly, and for a long-term basis, is effective in averting age-related bone loss. Harder relative intensities of effort and greater volume of physical activity are more effective in increasing bone density. Kohrt and colleagues recommend doing weight-bearing endurance activities 3 to 5 times per week, and resistance exercise 2 to 3 times per week for a total of 30 to 60 minutes per day to preserve bone health.
• Musculoskeletal Health & Sarcopenia
  - Muscle mass, strength, power and endurance are essential for the improvement of musculoskeletal health and movement.
  - Decrease in musculoskeletal health mainly due to inactivity and not solely age
• Sarcopenia
  - Age-related loss of muscle mass and strength
  - Loss of muscle strength → loss of independence, increase in falls, fractures, decrease in metabolic rate
• Daily physical activity incorporating large muscle groups improves musculoskeletal health & prevents sarcopenia
Slide 11

Body composition & obesity

• Most favorable approach to weight loss includes committed endurance exercise, resistance exercise, & caloric restriction

• Weight loss achievements
  – Cardiovascular exercise
    • 200-300 accumulated minutes moderate-intensity
  – Resistance training and circuit training
    • 2-3 x week using major muscle groups
    • Maintains/increases fat-free mass
    • Encourages loss of fat mass

Health benefits of Physical Activity

(Physical Activity Guidelines for Americans 2008)

Slide 12

Physical Activity Guidelines for Americans recommends engaging in two types of physical activity each week to improve your health. These include aerobic and muscle strengthening activities.

For Maximum Health Benefits, Adults Need:

◊ 2 hours and 30 minutes (150 minutes) of moderate-intensity aerobic activity every week or 1 hour and 15 minutes (75 minutes) of vigorous-intensity aerobic activity every week.

◊ 2 or more days a week of muscle strengthening activities that incorporate all major muscle groups (i.e. legs, hips, back, abdomen, chest, shoulders, and arms).

Where should I start?

First let’s define physical activity. Physical activity is anything that gets your body moving and your heart pumping.
Aerobic - light to vigorous-intensity physical activity that requires more oxygen than sedentary behavior and thus promotes beneficial cardiovascular fitness and other health benefits (e.g., jumping rope, biking, swimming, running; playing soccer, basketball, or volleyball).

Anaerobic – intense physical activity that is short in duration and requires a breakdown of energy sources in the absence of sufficient oxygen. Energy sources are replenished as an individual recovers from the activity. Anaerobic activity (e.g., sprinting during running, swimming, or biking) requires maximal performance during the brief period.

Lifestyle – physical activity typically performed on a routine basis (e.g., walking, climbing stairs, mowing or raking the yard), which is usually light to moderate in intensity.

Play activity that involves unstructured, spontaneous, and self-selected activities with flexible rules, usually for the purpose of having fun.

Sports – physical activity that involves competition, scorekeeping, rules, and an outcome that cannot be predetermined. There are two categories of sports: individual and team.

Weight-bearing – physical activity that requires people to move their own weight.


Where should I start?

Start slowly and pick activities you like. This way you develop lifelong habits of being active. Choose activities you enjoy and that fit into your lifestyle.

Ask yourself what kind of activities you do now or have done in the past that you like doing (e.g., walking, riding a bike, playing tennis, dancing).

Where can you do these activities? With whom?

Having a support system can help you stay physically active.

Work up to your goal slowly to avoid getting injured and so that you will enjoy yourself.

Spread your weekly goal over 2 to 3 days (or more) per week.

For example, start by walking briskly 10 minutes a day for 6 days a week and slowly build up to 30 minutes on 6 days a week.
Plan, plan, plan

Plan for your active week! #1 Excuse is lack of time!

1. Set aside one block of time for planned activity every day.
2. Set aside 2-3 smaller, 10-15 minute blocks of time each day to be active.

Think about your typical day. When can you set aside 20 to 30 minutes to do an activity you like? Make a standing appointment each day for physical activity.

Make active choices throughout the day to enhance your active lifestyle. Every minute of activity has a positive impact on your overall health and it all adds up.

Ex: park your car in the farthest parking space, take the stairs, take a walk around the office every hour, walk to the store, do sit-ups or squats during commercial breaks.

It is important not only to be active, but to shorten and break up periods of inactivity particularly sitting. Let’s think of ways to turn inactive periods to active periods.

Make being active a predictable part of your daily routine, like taking a shower may be a predictable part of your morning. Make a "standing appointment" for physical activity. Cut out some of your TV time by taking a walk instead, walking is a great way to relax and unwind; you will feel more refreshed than you would have you spent that time inactive. Make being active part of your regular routine so that you can establish a lifetime habit.

It is time well spent!
Muscle-strengthening activities
- Activities that strengthen your muscles
- These activities should work all the major muscle groups of your body: legs, back, chest, abdomen, shoulders, and arms
- Should be done at least 1-2 times per week
- Need to do as many repetitions as it takes to get you to the point where it's hard for you to do another repetition without help
- Try to do a certain number of repetitions in each set
- Do at least 1 set of each exercise and work up to 4 sets of each exercise for maximum health benefits
- Can be done on the same day as your aerobic training or on different days
- Allow at least 24-48 hrs of rest between working out the same muscle group again

Physical Activity Tips
 Resistance Training
- Warm-up and cool-down before each activity session. Do whatever activity you plan on doing at a lower intensity for a good 5-10 minutes at the beginning and the end of your exercise bout.
- Perform safe stretching:
  • Warm-up briefly before you stretch.
  • A safe stretch is gentle and held steady…DO NOT BOUNCE!
  • Always stretch both sides of your body…STAY IN BALANCE!
  • Always breathe through the exertion…. DO NOT HOLD YOUR BREATH!
  • Always STAY IN CONTROL, maintain stability and watch out for gravity
- If you have sharp pain during a particular movement, stop doing it.

One repetition is one complete movement of an activity, like lifting a weight all the way up and down or doing a sit up.
<table>
<thead>
<tr>
<th>Excuse</th>
<th>Counterpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>It's too early in the morning.</td>
<td>It's too early for what? Not for the birds. Get up earlier.</td>
</tr>
<tr>
<td>I ate.</td>
<td>All the more reason to walk it off. After dinner walks can be the best, especially with a family member.</td>
</tr>
<tr>
<td>I'm fat.</td>
<td>You'll weigh less if you keep moving regularly.</td>
</tr>
<tr>
<td>I'm too tired.</td>
<td>Exercise will give you energy, feel better when you're done.</td>
</tr>
<tr>
<td>The treadmill hurts my knees.</td>
<td>There are many other forms of exercise.</td>
</tr>
<tr>
<td>I don't have the right shoes.</td>
<td>Sometimes, compromise. Buy new shoes. Don't spend $100.</td>
</tr>
<tr>
<td>It's dark outside when I come home from work.</td>
<td>Wear some reflective materials and carry a flashlight.</td>
</tr>
<tr>
<td>I have only 20 minutes.</td>
<td>Not only is that enough time, it's far better than doing nothing.</td>
</tr>
<tr>
<td>It hurts to walk.</td>
<td>Doesn't it hurt to go five steps or 10 steps? Start with five steps and increase to 10 steps tomorrow. By the end of the week, hopefully go up to 20 steps. If so, then, you can walk anywhere in your shoes.</td>
</tr>
</tbody>
</table>
Chest pain or discomfort:
What: Uncomfortable feeling of pressure, pain, squeezing, or heaviness.
Where: Possibly in the center of chest, spread throughout the front of the chest, or even starting in the neck, jaw, and back.
What to do: Stop and sit or lie down.
If it doesn't go away after 2-4 minutes, go to an emergency room. If it does go away, let your doctor know about your episode.

Severe nausea, shortness of breath, cold sweats, feeling lightheaded or irregular pulse/palpitations:
What to do: Stop and sit or lie down.
If it doesn't go away in 5-10 minutes call your doctor.
If it does go away, let your doctor know about your episode.

Any of the above problems may be signs of something serious like a heart problem, so should never be ignored (Centers for Disease Control and Prevention, 2011)
Learn about calories
Gives you a sense of ownership
You increase control of what you are eating
The record helps you "bank" calories
You are aware of what you eat
Eating patterns become clear
Learn more about portion sizes
✓
1
2
3
4
5
6
7
Awareness

Is a key step in changing habits. The awareness you gain from record keeping has several benefits that will be discussed throughout this lesson.

In order to eat less fat and calories you must first figure out how many calories you are eating now.

Being aware of what you eat is the first step toward change.

(Kushner et al., 2009)

Benefits of Record Keeping

You learn about calories. There are calories lurking where you least suspect.

Becoming an expert insures you won't be derailed by calorie surprises.

For example, most people think yogurt is a good diet food. However, some flavored yogurts can have more calories than an ice cream cone. Ten innocent potato chips contain 110 calories, more than five cups of plain popcorn.
Benefits of Record Keeping

You learn about portion sizes. Measuring what you eat makes you aware of how much you are eating. If you don’t know what the portion size is, you can be eating double even triple the recommended amount! (Kushner et al., 2009)

Benefits of Record Keeping

You are aware of what you eat. You might be thinking, “of course I know what I eat.” However, one does not always recall the exact number of Doritos consumed at happy hour or the ounces of milk poured into the bowl of cereal. These are forgotten calories, sometimes because we like to forget them!

Ask the group if they can recall exactly what they ate/drank for breakfast two days ago.
Just 100 extra calories per day can lead to a 10# weight increase over a year
Just 200 extra calories per day can lead to a 20# weight increase over a year
It is important to know where you stand at the end of the day (Kushner et al., 2009; Constance et al., 2011).

Benefits of Record Keeping
You increase control over eating.
Knowing exactly where you stand with the day’s calorie count permits you to judge whether you can afford certain foods. You may have the calories “banked” to have that snack you are considering. Knowing where you stand makes the choice easier.

(Slide 7)

Benefits of Record Keeping
Eating patterns become clear. When you document how you felt after eating a certain food you become aware of what “triggers” you to eat. Once you know your trigger you can engage in other activities other than eating. It is important to know your trigger and have an action plan. This way you are never caught off guard.

(Slide 8)
Benefits of Record Keeping

Templates

Gives you a sense of ownership. You are responsible for what you eat. When we have a detailed record of everything we ate and how we felt when we ate it then we can begin making the necessary changes towards healthier eating. It is up to YOU! Only you can make the change.

(Kushner et al., 2009 Constance et al., 2011)

Three Important Factors You Must Follow In Order to Succeed

1. Be Accurate
2. Be Honest
3. Be Complete

- Measure portions
- Read food labels
- Include everything:
  - Meals
  - Snacks
  - “Tastes”

- Write down what you really eat and drink.
The amount you eat and drink plays an important role in your energy balance strategy.

- Most people eat more when they are served larger portions.
- Choosing smaller portions can help you lose weight and keep it off.
- Portions have increased over time.

Some common food portions contain the recommended allotment for the entire day:
- For example, some bagels weigh up to 5 oz – the entire day’s allotment of grains.

The Dietary Guidelines encourage you to enjoy your food, but eat less and to avoid oversized portions.

Watch portion sizes
Enjoy your appetizer and your main course is on its way.
JOIN THE SMALL PLATE MOVEMENT CHALLENGE
Eat off of a 10-inch plate for your largest meal of the day for one month.

People eat 15 – 25% more off of larger serving dishes and from large packages. Six ounces of spaghetti on an eight-inch plate is a nice serving size. Six ounces on a 12-inch plate looks like a tiny appetizer. Make visual illusions work for you.
(Wansink, 2006.)

Portion Distortion
How many calories do you think are in today’s bagel?

Today: 140 calories
3-inch diameter

20 Years Ago: 350 calories
6-inch diameter
Slide 15

Portion Distortion

- 6-inch diameter
- 350 calories
- Today
- 3-inch diameter
- 140 calories
- 20 Years Ago
- Calorie Difference: 210 calories

Slide 16

Maintaining a healthy weight is a balancing act...

Calories In - Calories Out
Maintaining a healthy weight is a balancing act...

**Calories In – Calories Out**

50 minutes of raking leaves

---

**Portion Distortion**

How many calories do you think are in today’s cheeseburger?

Today: 333 calories

20 Years Ago: 500 calories

How many calories do you think are in today’s cheeseburger?
Portion Distortion

Today: 590 calories
20 Years Ago: 333 calories
Calorie Difference: 257 calories

Maintaining a healthy weight is a balancing act...

Calories In – Calories Out

How long will it take to burn those extra 257 calories?
Maintaining a healthy weight is a balancing act...

**Calories In = Calories Out**

90 minutes of weightlifting

---

**Portion Distortion**

How many calories do you think are in today's portion of spaghetti with meatballs?

Today
500 calories
1 cup spaghetti with sauce and 3 small meatballs

20 Years Ago
Portion Distortion

Today

2 cups of pasta with sauce and 3 large meatballs

500 calories

1 cup spaghetti with sauce and 3 small meatballs

20 Years Ago

Calorie Difference: 525 calories

Calories In = Calories Out

Maintaining a healthy weight is a balancing act...

How long will it take to burn those extra 525 calories?
Maintaining a healthy weight is a balancing act...

Calories In – Calories Out

Portion size is often the missing link in weight management. Many dieters and cook books calculate the calories in various food items based on “a piece” or “a serving”. For example the calorie content for a muffin in a recipe might be 180 calories, this amount is only accurate if the muffin weights 2 ounces. What if the muffins you make weigh 6 oz, the calorie content is now 540 calories a difference of 360 calories. We said earlier in order to lose a pound a week you must have a negative 500 calorie balance, this one error made every day will cost you that 1 lb weigh loss. (Kushner et al., 2009)

When you make the commitment to weight loss, you will have to weight and measure everything until you have an idea of what various serving sizes look like.

Once you start to recognize portion sizes you may not need to be as rigid. However, it is a good idea to check every now and then to be sure your portion sizes haven’t started creeping up.
All fats are 9 kcal per 1 gram so still need to watch fat content
Eating too quickly doesn’t allow your mind and body to signal you to stop eating until it is too late and you are stuffed. The gut sends hormones to the brain to signal fullness. Practice slow eating, this allows each bite to be a conscious one and puts pleasure and enjoyment back into mealtime. Eating slowly may reduce intake by 70 calories per meal, which can translate to more than 200 calories per day. When you slow the speed of eating, you are better able to recognize more subtle signs of fullness. (Remember it is better to waste food in the trash then in your stomach)

Slow your pace of eating by putting your fork down between bites, chew food thoroughly before swallowing this not only helps you enjoy your food but it also helps your body by easing the work of digestion (may prevent indigestion). Scoop less food on each fork or spoonful. Stop “preloading” – filling up a fork or spoon in anticipation of your next bite before you are done chewing the previous bite. This prevents you from enjoying
what you are presently eating and makes you anxious for eating the next bite. Eat without distraction; even slight distractions can increase portion size by about 70 calories. Eating big portions doesn’t have to lead to weight gain because many foods are low in calories even in large amounts. Eat more energy dense foods such as vegetables, fruits and broth soups at mealtimes. Consuming foods with high water content decreases (low energy food) intake at a meal by at least 100 calories. Eating soup or salad can decrease calories eaten at the meal. Eating 3 cups of salad with low-fat dressing and low-fat cheese (100 calories for salad) may decrease calories at the meal by 12% - but remember you have to be conscious of stopping when you are full for this to work. 25:25:50 rule: 25% favorite whole grain or starchy food such as potatoes (1 cup or less) 25% is a lean protein such as chicken or fish (about the size of a deck of cards) and 50% or more of their plate is filled with produce. You can eat 31% more when using a large bowl instead of a smaller one and 14.5% more when using a large spoon rather than the small version. Remember each packaging has its own serving size, even if it is the same food but a different brand. Serve yourself the serving size and put the rest away. Use measuring tools we practiced to help you serve the correct portion size, there can be up to a 30% error if we just rely on “eyeing” it. Purchase single serve containers at first to help you get used to one serving. Don’t eat out of the bag, serve yourself the correct portion and put the rest away, you are more likely to overeat if you don’t.
Take your serving size handouts with you when going out to eat; restaurants may serve up to 3 times the serving size recommended. If the bread basket or chips bowl is too tempting, have one piece of bread or one serving of chips and ask the waiter to take the rest away. Think twice about meal deals to make sure the combo special isn’t a portion trap in disguise. If a good deal saves you money at the point of purchase but will drain on your health down the road from the extra fat and calories, then in the long run it may cost you extra money on medications, doctor visits and time off from work. Share entrees or order from the appetizer menu to avoid overeating. (Kushner et al., 2009)
THANK YOU!
Objectives
Identify common myths and where they come from
Replace myths with facts
Discuss where myths come from and why we hold on to them
Give scientific based tips that WORK
✓
1
2
3
4

Where do Nutrition Myths come from?
Advertisements, Magazines, Internet
Friends, coworkers
Celebrities
“Old wives tales”
Media – Oprah, Dr. Oz
Passed down from family members
Trainer at the gym
✓
1
2
3
4
5
6
7
Slide 4

**Fact or Fiction**

- Fad diets work for long-term weight loss
- "Loose 30 pounds in 30 days"

**Myth**
- Promises quick results
- Are hard to follow for extended periods
- May lose weight initially but it tends to return
- Generally unhealthy due to nutrient restriction
- Losing more than 3 lbs / week increases risk for gallstones
- <800 kcal diets increase risk for heart rhythm abnormalities

Slide 5

**Nutrition Tips**

- Moderate portions
- Build a physical activity plan
- Healthy weight loss suggestions
  - ½ - 2 lbs per week
- Don’t be fooled by flashy advertisements and celebrity endorsements
- Beware of too good to be true statements
- What are some common myths you have heard?
Fact or Fiction

Myth
Fact

- Need to use more calories than you eat
- Remember the energy balance equation
- Either limit calories "in" per day or increase physical activity

Nutrition Tips

- Portion control
- Can still eat foods I love but total number of calories count
- Moderation is key
- Make sure to have a variety of nutrients
- Keep a food journal to keep track of everything you eat throughout the day
Slide 8

Fact or Fiction

High Protein / Low carb diets are a healthy way to lose weight.

Myth
Fact
 Unbalanced diet
 May be eating too much fat and/or cholesterol = increase risk of heart disease
 Too little fruits and vegetable = lack of fiber, vitamins & minerals
 Nausea, tired, weak from low carbohydrates
 Carbohydrates = energy
 <130 g CHO can cause ketones and kidney injury
 Increase risk of gout & kidney stone risk

Slide 9

Nutrition Tips

✓ Reduced calories with recommended Fat, Protein & Carbohydrates
   You can manipulate the amount of macronutrients you eat as long as you stay within the recommended percentages
✓ Greater variety leads to a greater chance of sticking with the plan
✓ Balanced diet doesn’t cut out any of the food groups
   You don’t feel deprived
   You don’t become deficient in nutrients
Fact or Fiction

Starches are fattening and should be limited or avoided when trying to lose weight

Myth

Fact

- Many foods high in starch are low in calories and fat
- However, any nutrient eaten in excess can lead to an increase in fat accumulation
- Complex carbohydrates give the body energy
- What do you know to be a starch...

Nutrition Tips

- Replace regular potatoes with sweet potatoes or yams
- Replace ½ your grain content with vegetables
- Eat a diet that:
  - Promotes fruits, vegetables, whole grains, fat-free low-fat milk products
  - Incorporates meats, poultry, fish, beans, eggs and nuts
  - Is low in saturated fats, trans fats, cholesterol, salt and added sugars
Fact or Fiction

- Certain foods like grapefruit, celery, or cabbage soup are burnt fat and make you lose weight.

- No food can burn fat.
- Caffeine may speed up metabolism for short periods, but does not cause weight loss.
- What other foods/methods have you heard "burn fat"?

Nutrition Tips

- Cut back on calories
- Be more physically active

These are the best tools to lose weight.
Fact or Fiction

Natural or herbal weight-loss products are safe and effective

Myth

Fact

- Typically not scientifically proven as "safe"
- Generally not FDA-approved
- Some herbal products have caused death (e.g., Ephedra)

Have you/do you know someone that has tried any supplements?

- Side effects?

Nutrition Tips

- Talk with your healthcare professional BEFORE you try any supplement
- Do your research!
Fact or Fiction

**Fact**: Fat-free or low fat means no calories.

**Myth**: Often times have same amount or more calories from added sugars.

**Fact**: Added sugars, flour, starch, and thickeners add calories.

**Fact**: Usually leave you less satisfied.

---

**Nutrition Tips**

- Read the nutrition label
- Check the serving size
- Let’s practice (practice makes perfect)
**Fact or Fiction**

- Fast food restaurants are always an unhealthy choice and you should not eat them when dieting.

**Myth**
- Knowing how to incorporate them is key.
- Do not have to be completely avoided.
- Realistically, how can we do this? Have you ever tried to completely avoid fast or convenience food?

**Nutrition Tips**
- Avoid super-sized combos.
- Split with a friend.
- Choose water or fat-free milk instead of soda.
- Try the “fresco” taco instead.
- Fried foods should be chosen sparingly due to fat and calorie content.
- Use small amounts of high-fat toppings and dressings.
- Read the nutrition information on the restaurant’s website.
**Fact or Fiction**

Skipping meals is a good way to lose weight

**Myth**

- Skipping meals tends to make you feel hungrier, which makes you eat more
- Not intended for long-term weight loss
- Eating many small meals throughout the day can help control appetite

**Fact**

- Eat small meals throughout the day
- Fruits and veggies are full of water and fiber and can help you feel less hungry
- Eat a variety of foods
- Take snacks with you so you aren’t tempted by the vending machine
- Don’t wait longer than 3-4 hours between meals

**Nutrition Tips**
Fact or Fiction

Myth
Nuts are fattening and you should avoid them if you are trying to lose weight.

Fact
- High in calories and fat
- However, nuts contain healthy fats
- Good source of protein, fiber and minerals

Nutrition Tips
- Control your portions
- Choose raw or dry roasted
- Typically roasted nuts have additional oils added to them which can increase the total fat and calories per serving
- 1/2 oz of mixed nuts has about 84 calories
- Good options:
  - Almonds
  - Pistachios
  - Walnuts
Fact or Fiction

- Dairy products are fattening and unhealthy

- Low-fat/fat-free options are just as nutritious as whole milk products but with fewer fat and calories

- Dairy has several nutrients the body needs

- Protein, calcium, Vit A & D

Nutrition Tips

- Dietary Guidelines for Americans recommends 3 cups/day of low- or fat-free milk/milk products
- Look for fortified milk alternatives if lactose intolerant
  - Soymilk, Almond milk, Rice milk
- Use fat-free Greek yogurt in place of sour/heavy cream
What myths have you heard of lately?
Where did you hear them from?
Are you ready to squash those myths?

THANK YOU!

Paleo Diet/ "Caveman" Diet
• Based on what humans ate during the Paleolithic era
  • Fish
  • Grass-fed meats
  • Fruits and Vegetables
  • Berries
  • Nuts
  • Fungi
  • Roots
• And excludes modern day foods
  • Grains
  • Legumes
  • Dairy products
  • Refined salts
  • Refined sugars
  • Processed oils
Paleolithic Diet

Pros
- Improvements in weight, BMI, and waist circumference
- Reduction in insulin and total cholesterol
- Consistent with current dietary guidelines:
  - Eat less salt and added sugars
  - Eat more fruits, vegetables, and lean protein

Cons
- Deficiency in vitamins D and E
- Increased exposure to environmental toxins from increased intake of fish
- Cost

Scientific studies have mixed results on whether the paleo diet affects diabetes and heart disease. Current research supports whole grains, low-fat dairy, and legumes as part of a healthy diet.

Cabbage Soup Diet

Who can see a problem with this long term? Do you think you could maintain this type of eating for longer than one week?
Cabbage Soup Diet

Pros
- Quick weight loss due to low calories
- Allows people to eat increase amounts of fruits and vegetables

Cons
- Limited food choices
- Boring
- Inadequate nutrition
- GI discomfort
- Hasn’t been shown to give long term weight loss
- Weight rebound

The HCG Diet

- A diet consisting of 500 calories a day with under-the-tongue drops or injections of hCG
- hCG is a hormone produced during pregnancy
- The diet claims that hCG suppresses hunger and forces the body to use fat for fuel, allowing a person to lose several pounds a day
Slide 7

Pros of the HCG Diet

- There is no scientific evidence that supports hCG as a weight loss aid... No real pros

Slide 8

Cons of the HCG Diet

- The oral hCG may contain little, if any, hCG
- Weight loss is due to the very-low calories, not that hCG
- The FDA, the American Society of Bariatric Physicians, the American Medical Association and the Academy of Diets and Nutrition do not recommend or support hCG as a weight loss aid
- Nutritional deficiencies due to very limited calories
**Atkins Diet**

- A diet that is low in carbohydrates and high in protein and fat
- The theory is that by consuming a low-carbohydrate diet, your body doesn't rely on carbohydrates for energy and instead burns its fat stores to result in weight loss

**Pros**
- Follows current recommendations on eliminating refined carbohydrates (cakes, sweets and white bread)
- Diet allows foods that most people like, such as meat, cream cheese, butter and other high-fat foods
- Dieters rarely go hungry because there is no limit on how much they can eat, just what they eat

**Cons**
- It puts your body into a state of ketosis because of the decreased amounts of carbohydrates
- Supplementation may be necessary due to the dietary restrictions
- Side effects include:
  - Constipation
  - Dehydration
  - Bad breath
- Complications include:
  - Osteoporosis
  - Hypotension
  - Liver and kidney problems
Ketosis

- When the body runs out of what carbohydrate it has in the bloodstream and stored in the liver, it begins to use fat as fuel, creating ketones.
- Fat and protein have main functions in the body, including building and repairing tissues and cells; they aren’t meant to be our main source of fuel.
- Important organs, such as the brain, need glucose to function; during prolonged periods of ketosis the body adjusts to use ketones as fuel for organs that require glucose.

Master Cleanse Diet/Lemonade Diet

- A diet where the only food allowed is a lemonade made from lemons, pure maple syrup, cayenne pepper, and water.
- This beverage should be drank, a minimum of 6-12 times a day.
- This diet should be followed for 10 days.
- In addition to the drink, a laxative should be taken in the morning and in the evening.
Pros of the Master Cleanse Diet/Lemonade Diet

• There is no scientific evidence to support the Master Cleanse as a short-term diet

Cons of the Master Cleanse Diet/Lemonade Diet

• The diet is deficient in:
  • Vitamins
  • Minerals
  • Carbohydrates
  • Fats
  • Protein
  • Fiber
  • Calories
  • May rob your intestines of healthy bacteria that aid in digestion and immunity
  • Loss of lean muscle tissue
  • Because your robbing your body of food, it is likely that a binge will occur after you are done with the diet- which will cause you to regain the weight plus more

Discuss the health related consequences of electrolyte imbalances due to laxative effect
Diet and Exercise
The tried and true method!

**Vitamins**

- Organic compounds that the body needs to grow and develop normally
- Each vitamin has a specific job in the body:
  - Vitamin A: vision
  - Vitamin E: immune system
  - Vitamin K: blood clotting

**Minerals**

- A naturally occurring substance that are necessary for many jobs in the body, such as building bones, making hormones and regulating your heartbeat
- Each mineral has a specific job in the body:
  - Calcium: muscle contraction
  - Iron: Help carry and store oxygen in the body
  - Sodium: Fluid balance
  - Potassium: Fluid balance, bone health, cardiovascular function

(Gropper, Stepnick, Smith, & Groff, 2009).
Phytochemicals

- Compounds produced by plants that have an antioxidant or hormone-like effect in the body
- Generally have protective or disease preventative properties
- Carotenoids
- Flavonoids
- Isoflavones
- Phenolic acids

(Collins, 2014)

Carotenoids

- Includes:
  - Beta Carotene
  - Lutein
  - Lycopene
- Produces deep green, yellow, orange and red pigments in fruits and vegetables:
  - Carrots
  - Pumpkin
  - Sweet potatoes
  - Tomatoes
  - Papayas
  - Broccoli
  - Kale
Flavonoids

- Includes:
  - Epicatechin
  - Hesperidin
  - Isorhamnetin
  - Kaempferol
  - Quercetin

- Health-promoting effects include:
  - Anti-allergic
  - Anti-cancer
  - Antioxidant
  - Anti-inflammatory
  - Anti-viral

- Sources:
  - Fruits
  - Teas
  - Soybeans

Isoflavones

- A class of phytostrogens- plant derived compounds with estrogenic activity

- Includes:
  - Daidzein
  - Genistein

- Sources:
  - Legumes
  - Soybeans
  - Soy products

- Benefits:
  - Anti-carcinogenic
  - Anti-atherogenic
  - Anti-osteoporotic
**Phenolic Acid**
- **Includes:**
  - Capsaicin
  - Ellagic acid
  - Gallic acid
  - Rosmarinic acid
  - Tannic acid
- **Sources:**
  - Walnuts
  - Strawberries
  - Chili peppers
  - Mangos
- **Benefits:**
  - Anti-oxidant
  - Anti-inflammatory

**Antioxidants**
- **Substances that help protect and repair cells from damage caused by free radicals**
- **Free radicals:** molecules produced when your body breaks down food or by environmental exposures like tobacco smoke and radiation
- **Antioxidants can be vitamins, minerals or other naturally occurring compounds in foods:**
  - Vitamin E
  - Selenium
  - Lycopene
Antioxidant Vitamins
- Vitamin E
- Green leafy vegetables
- Legumes
- Nuts and seeds
- Vitamin C
- Citrus
- Red and green peppers
- Tomatoes
- Beta-carotene (Vitamin A)
- Liver and egg yolks
- Carrots
- Yams

Antioxidant Minerals
- Selenium:
  - Tuna
  - Beef and poultry
  - Fortified breads and other grain products
- Zinc:
  - Oysters and seafood
  - Beef and poultry
  - Beans and nuts
  - Dairy products
  - Fortified cereals
Other Antioxidants

- Quercetin:
  - Apples
  - Red wine

- Leteolin:
  - Celery
  - Green bell peppers

- Catechins:
  - Tea

- Lycopene:
  - Tomatoes
  - Guavas
  - Asparagus

- Lutein
  - Kale
  - Turnip greens
  - Spinach
  - Broccoli

(Collins, 2014)

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Nutrient vs. Energy Density

**Nutrient density**
- Refers to the ratio of good-for-you nutrients that a food contains to the amount of energy it provides.
- Nutrient dense foods provide:
  - Vitamins
  - Minerals
  - Fiber
  - Antioxidants and Phytochemicals

**Energy density**
- Provide little or no essential nutrients and are full of calories.
- Energy dense foods usually contain more:
  - Sugar
  - Fat

Energy density refers to the amount of calories (energy) for a specified amount (volume) of food.
In order to lose weight we need to eat fewer calories. This can leave us feeling hungry because we are eating less food. Eating the same or more VOLUME while eating less ENERGY can help solve both these issues. Fill up on foods that have low energy density and eat less foods with high energy density.

People tend to eat the same weight, or amount, of food each day, regardless of the calories they take in. Since some foods are less energy dense than others—that is they have fewer calories gram per gram—filling your plate with more of these means you’ll eat less calories without eating less food. Low-density foods, which are low in calories and high in volume help you feel full and satisfied while dropping pounds. (Rolls and Barnett, 2000)

Very low-density foods are usually high in fiber and water content:
- Non-starchy vegetables
- Nonfat milk
- Soup broths

Low-density foods are slightly higher in carbohydrate and/or calories:
- Starchy fruits and vegetables
- Grains
- Low-fat meat
- Legumes

Low-density foods provide few calories per portion (volume) of food (Rolls and Barnett, 2000)
The basic principles of eating more volume for less calories is:
- Reduce fat
- Add fiber
- Add water
- Add fruits and vegetables

By increasing the volume of food, you will consume fewer calories, enjoy a satisfying portion of food, and keep hunger in check!

Nutrient Dense Foods with Low Energy Density

How to increase volume in your meals

Add whole fruits, vegetables, soups, stews and casseroles

- Make soup, stews and casseroles
- Start meals with broth-based, low-fat soups
- Dilute fruit juice with water or soda water
- Chose whole fruits, vegetables, soups, stews and casseroles
- Half your meal with fruit, a fresh vegetable, or a whole grain
- Add water to the dishes you cook
- Snack on raw veggies such as cauliflower, broccoli, carrots, celery
- Add vegetables to your cooked dishes
- Substitute vegetables for half the grain in dishes

Always have fresh, frozen or canned fruits and vegetables on hand to add to meals, casseroles or mixed meat dishes. Ex: add spinach, diced carrots and extra onions to chili. Add broccoli to pasta dishes. Add plenty of vegetable to pasta sauce. “Rice” cauliflower and substitute it for regular rice or use it for pizza dough.
Fiber is found only in plant-based foods, such as fruits, vegetables, and grains. Fiber comes primarily from the tough cell walls of plants. These materials include cellulose, hemicellulose, lignin, and pectin. Fiber is not broken down by digestion like other foods and basically retains its structure during its transit through the digestive system. Fiber also absorbs water during the digestive process. When you chew and swallow food, both the chewing and saliva begin to break food down into smaller nutrients.

Stomach acid continues the process as food moves along, then more digestion continues in the small intestine. Toward the end of the line, waste products combine with water in the large intestine and are eliminated as stools. A stool with much water is larger and softer and moves through the colon more easily. A stool with little moisture is small and hard and creates the discomfort of constipation. This moisture helps with movement of waste products through the bowel. Increase the amount of fiber in the diet slowly, so you do not develop a crampy, bloated stomach. Make sure to drink plenty of liquids as you increase your fiber intake. Many different forms of fiber exist, so you should eat a variety of high-fiber foods and whole-grain breads and cereals to get all of the benefits. (Mahan et al., 2012)

<table>
<thead>
<tr>
<th>How much fiber do I need?</th>
<th>For adults, needs vary by age and gender:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helps keep us “regular” and prevents constipation</td>
<td></td>
</tr>
<tr>
<td>Might help protect against certain chronic diseases:</td>
<td></td>
</tr>
<tr>
<td>– Diabetes</td>
<td></td>
</tr>
<tr>
<td>– Heart disease</td>
<td></td>
</tr>
<tr>
<td>– Cancer</td>
<td></td>
</tr>
<tr>
<td>Plays a role in weight loss, because high-fiber foods make you feel fuller and they displace higher-calorie foods in the diet</td>
<td></td>
</tr>
</tbody>
</table>

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Tips for adding more fiber to your diet

Use more dried beans, such as:
- Black beans
- Black-eyed peas
- Sweet peas
- Pinto beans
- White beans
- Lentils

Include higher-fiber fruits in your diet, such as:
- Prunes
- Apricots
- Plums
- Raisins
- Cantaloupe
- Blueberries
- Apples (with skin)
- Pears

Serve high-fiber vegetables, such as:
- Kale
- Broccoli
- Cauliflower
- Spinach
- Squash
- Zucchini
- Celery
- Carrots
- Onions

How to increase volume in your meals

Vegetable salads – any combination of vegetables will work, try something new to add variety and prevent boredom
- Use low calorie dressing to avoid a calorie pitfall
- Add chicken, tuna, fish or beans to make a complete meal
- Bean salads – combine three or more different types of beans with vegetables, herbs and a vinegar based dressing
- Numerous research studies report that starting your meal with soup helps people eat less calories total calories in the meal
- Broth-based soups have shown to help people lose weight and keep it off
- Soup takes a long time to eat, fills up your stomach, and takes time to empty, which keeps you satisfied longer
- Add beans (black, kidney, chickpea, soybean) or lentils to soups, stews, chili, salads, pasta, rice, casseroles, pizza and pasta sauces
- Puree legumes and use as dips or for spreads on sandwiches

Soup takes a long time to eat; this will give your brain enough time to recognize you are getting full, preventing you from overeating.

Soup takes up volume in your stomach so you end up eating less. Make sure the soup is 100 calories or less (Rolls and Barnett, 2000).
Energy Dense Foods

Foods with a lot of fat are very energy dense because fat contains the most calories per gram of the other nutrients.

Pre-packaged foods are very energy dense because of the added fats and sugars.

Foods with added fats and sugar provide lots of energy but come in very small packages.

High-density foods include:
- Meat
- Cheese
- Pizza
- French fries
- Salad dressing
- Bread
- Ice cream
- Cake

Very high density include:
- Crackers
- Chips
- Cookies
- Chocolate
- Nuts
- Butter
- Alcohol

Eating less of these foods will automatically help lower your total caloric intake because they contain a lot of calories in small quantities, therefore we need to eat more to feel full, this leaves us in an energy overload and prevents us from losing weight and contributes to weight gain. (Rolls and Barnett, 2000)

Which do you think would keep you satisfied longer?

Meal 1
- Roast turkey breast (3 ounces [oz]) on whole-wheat bread with low-fat cheese (1 oz)
- Lettuce and tomatoes
- Apple
- Whole-grain crackers
- Water with lemon slice

Meal 2
- Bacon cheeseburger
- Calories (75% total fat)
- Whole-grain
- Multiple grams
- 838 calories
- Water with lemon slice
- Apple

USDA nutrient database 545 vs 595
Which do you think would keep you satisfied longer?

1. 1 C whole-wheat spaghetti + 1 C fat-free spaghetti sauce, topped with broccoli, sweet bell peppers, onions, and zucchini
2. 1 C strawberries + 1/2 C fat-free frozen vanilla yogurt + Side salad with 1 Tbsp fat-free dressing
3. Water with lemon slice
4. Whole-grain roll

Meal 1: 623 kcal
Meal 2: 647 kcal

USDA nutrient database 623 vs 647

---

Which do you think would keep you satisfied longer?

Meal 1: 160 kcal
Meal 2: 174 kcal

USDA nutrient database 160 vs 174
Which do you think would keep you satisfied longer?

- 25 stalks of celery
- 4.5 green peppers
- More than 3 cucumbers
- 3 cups of spinach
- 1.5 cups of beets
- 2 cans of green beans
- 1 head of Romaine lettuce
- 1 medium/large baked potato

USDA nutrient database 120 vs 160

Lighten up your snacks

- Medium-size apple = 72 calories
- Medium-size banana = 105 calories
- 1 C steamed green beans = 44 calories
- 1 C blueberries = 83 calories
- 1 C grapes = 100 calories
- 1 Tbsp hummus = 46 calories, serve with:
  - 1 C carrots = 45 calories
  - 1 C broccoli = 30 calories
  - 1 C bell peppers = 30 calories

USDA nutrient database
Don’t overwhelm your food with added calories

- Eat fruits and vegetables the way nature provided or with fat-free or low-fat cooking techniques:
  - Add herbs and spices
  - Cook in reduced sodium vegetable broth
  - Use homemade dressings
  - Add oils last to add flavor but avoid overuse
  - “Cut” your grains with cauliflower or spaghetti squash

Ask participants to discuss what they think they can do to add volume to their meals while cutting calories. Ask if these are changes they can make to their diet, have them write what changes they will do and how many times per week they will make these changes.

Cooking

- Cooking can destroy a lot of vitamins, minerals, phytochemicals and antioxidants
- This varies by the cooking method
  - Boiling vegetables tend to lose the most
  - Steaming vegetables tend to retain the most

(Collins, 2014)
Raw Foods

- Eating raw foods allows the body to capture all of the phytochemicals and antioxidants that could be lost in cooking water
- This could include eating raw fruits and vegetables but other options include:
  - Making raw lettuce wraps
  - Making raw soups or sauces with a blender
  - Making energy bars with dates and nuts
  - The ideas are endless...

(Collins, 2014)

Raw Food Recipes

- Some raw recipes that are common are:
  - Pico di gallo
  - Guacamole
  - Gazpacho
  - Pasta sauce
  - Smoothies
• But you can also make raw…
  - Lasagne
  - Vegetable pasta
  - Energy bars
  - Tortilla chips

Hand out recipes. Do food demo and tasting!

THANK YOU!
Slide 1

Slide 2

Saving Money
Create A Budget

- Know how much you want to spend
- Keep your receipts to track your spending
- Make a list of your monthly bills and expenses and decide how much you have left for groceries each week
- If you do not create a budget, you may overspend

By keeping your receipts you can see how much things cost and it can help you to establish a budget for the things your family uses.

Plan A Weekly Menu

- Look for recipes that use few ingredients
  - Allrecipes, Cooking Light, Pinterest
- Make sure to check your pantry for the items you need
  - You do not want to re-buy items you already have
- Check grocery store ads so you plan your weekly menu around what is on sale
  - Meats, produce, grains

Buy based on recipes with few ingredients you can cut down on the cost of the meal. Try buying spice blends, this way you don’t have to purchase each individually.
SAMPLE SIX DAY MENU

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Grocery list based on week menu. Remember to check your pantry so you don’t double buy.
### Look For Sales

- Every store has weekly sales
- Be on the lookout for in-store sales not advertised
- Look on the higher and lower shelves
  - This is where most unadvertised specials are located
  - Only buy sale items if you are going to use them

### Clipping Coupons

- Check newspapers, flyers, and stores for coupons
- You can save 10-20% of your bottom line
- Only use coupons for items you need
- Coupons can trick you into thinking you are saving (advertising trick)
- If you do not need the item you are not saving
- Get coupons online
  - [http://lozo.com/](http://lozo.com/)

The circular can help you to develop your weekly menu and list.

Not all things on sale will be in the circular so keep your eyes open for specials while you are in the store. Make sure to take advantage of the specials for things that you know your family will use.

Some specials aren’t really a deal… check the unit cost and compare to other brands… They may be cheaper per oz/lb/etc.
Store Savings

- Use your store's savings card
- Many grocery stores offer additional savings when you use your store card
- Smith's & Vons
- If you have the time “price match”
  - Wal-Mart will match the sale prices that other stores are running and can help you to save a bundle
- Do your homework
- Take the ad with you

Smith's offers a store card that gives you points based on how much you spend. These points can be used for savings on gas at Shell stations or they will cash in your points and send you a coupon for a dollar amount. Depending on how much you spend you may get anywhere from $15 to $60

Your pantry list should contain all the items you normally use. You can keep it posted near the pantry. To make it easier when it comes time to make your list, put a slash next to each item for the number of items you have (if two cans of corn, put two slashes), when you use something you can mark it off by turning the slash into an “X”. If you always go to the same store, you can prepare your list to reflect the layout of the store. This can help you to get the items you need quickly without covering every inch of the store, which can lead to impulse buying.
**Keep Track**

To stay within your budget, keep track of item costs as you go through the store.

**Round off:** If an item costs $2.89, round up to $3.00. As your running total gets closer to your budget, you can decide what items you may not need. This ensures that you stay within your budget.

---

**Stocking Up on Sale Items**

- When things are on sale, stock up.
- Make sure that when stocking up on items they are things that you know will be used.
- Fresh fruits and vegetables can be steamed and frozen for later.
- Bread, meat, and dairy products can be individually packaged and frozen.
- Nonperishables can be kept in the pantry just make sure to rotate FIFO (first in, first out).

---

Always check the expiration date because often times they put things on sale because they are about to expire but if you don’t use them before their expiration date they will be wasted and you will end up spending money on things you cannot even use.
Avoid Extra Trips

- Cut back on “one-item” trips
  - You will inevitably buy more than that one item and spend money that you did not figure into your budget
  - If you must make an extra trip for an ingredient or two always make a list
- Avoid trips to the corner store
  - Corner stores and gas stations are the most expensive for food items - right up there with airport stores

Buying in Bulk

- Plan one trip a month for bulk items
  - Try to avoid buying on impulse
  - If you did not plan on buying it in the first place, don’t buy it
  - Shop with a friend/roommate to share the cost
- Buy in bulk when it makes sense
  - If you can save money in the long run, plan to buy in bulk
  - Make sure you will use all of it before it goes bad
    - If you don’t use it, it is not cheaper

Buying on impulse can lead to purchasing things you do not use or need and in the long run cost you more money.
Don’t Go to the Grocery Store Hungry

- Shopping when you are hungry can make you buy things you do not really need
- Before you go to the store, eat a satisfying meal to keep your mind on task and stick to your list!

Choosing Foods
Shop The Perimeter

Fresh fruits & vegetables, dairy products and fresh meats

Foods that are located in the perimeter of the store:

- Shop the perimeter of the store so that you spend the majority of your budget on nutritious foods.
- Focus on nonperishables, such as whole grain pastas, brown rice and high fiber cereals.
- Double check your budget and list.

Once you have shopped the perimeter, only go down the aisles that you need to.

Slide 17
Read Food Labels

Pay attention to:
- Calories
- Serving sizes
- Total fat, saturated fat, trans fat
- Sugar
- Fiber
- Sodium
- Good/Excellent sources of other nutrients
- Read ingredient lists

Buy whole foods
- Processed foods generally lack in nutrition
- Look for foods in the least processed form
  - Buy whole grain bread instead of white bread
  - Look for whole grain pasta, couscous, bulgur, buckwheat, oatmeal, cracked wheat, wild rice
  - Buy fresh fruits instead of canned
  - Fresh fruit can be a little more expensive so if cost is a factor buy canned. Choose fruits packed in their own juice. Buy fruit in limits.
- Avoid sugary cereals
  - Buy whole grain cereal or oatmeal and add fruit for flavor (look for ≥3 g fiber, ≤3 g fat per serving)

Look for “whole wheat”, “whole grain”, “multigrain”, or “cracked wheat” as the first ingredient.
Fruits and Vegetables

- Are rich in vitamins, minerals, fiber
- Contain phytochemicals & antioxidants
- Whole fruit has more fiber and less calories than juice
- Find out when your grocery store stocks its fresh fruits and vegetables
  - If you know when they are stocked you can buy them at their freshest and ensure that they last longer with less waste
- Buy frozen fruits and vegetables
  - Frozen fruits and vegetables are flash frozen at their peak freshness to retain nutrients

Soup

- Many brands now offer “no salt added”, low sodium, or reduced-sodium varieties
- Check the label for fat and calories
- Cream based soups are often high in fat and calories
- Many soups are full of vegetables and legumes
- You can add your own vegetables to broths for a quick nutritious meal

Ask the produce manager when they get their deliveries. The longer it’s on the grocery store shelf, the less time you will have to use it before it spoils.
**Meats**

- Try to cut back on big portions of meats
- Meats can be expensive and eat up your budget
- Plan vegetarian meals a couple of nights a week
- Beans are inexpensive and an excellent source of protein
- When buying meats, choose larger cuts of meat that are less processed
- Do the prep work yourself
- Cut up large roasts or whole chickens, trim the fat yourself
- Use a large cut of meat for several meals throughout the week
- Have roasted chicken one night and shred leftovers for salads, tacos, enchiladas, wraps, or casseroles
- Look for Lean Cuts of beef
  - Tenderloin, Sirloin, Flank, Round

**Fish & Seafood**

- Choose fresh, frozen fish without breading, & water-packed canned fish
- Most fish seafood items are a low fat calorie protein source
- Shellfish are higher in cholesterol but very low in saturated fat
- Use within 3 days of purchase or freeze it
- Smoked and pickled fish are high in sodium
- Limit to 12 ounces per week if pregnant
- Look for government warnings (EPA)

Whole cuts of meat, such as roasts and whole chickens are typically less expensive and can either be cooked whole or broken down before cooking.
Peanut & Other Nut Butters
- Common varieties: peanut, almond, cashew, walnut, hazelnut
- Consider seed butters for new flavor or for nut allergies (i.e. sunflower seed)
- Look for reduced-fat varieties and/or trans fat free varieties
- Natural butters contain no trans fat
- Check freshness date
- Watch calories per serving

Dairy
- Look for low-fat and/or non-fat items
- Quality sources of protein & calcium
- Milk can be expensive so try to buy only the amount needed for the week
- Stock up on yogurt
  - Yogurt is a nutritious and inexpensive snack to have on hand. Look for yogurt with live cultures
  - Add fruit for extra flavor
- Look for low-fat or fat-free cheese, <5 g fat per oz
- If using soya/almond milk, look for calcium fortified

Practice portion control; nuts are healthy but contain a lot of calories.

Milk, cheese and yogurt can all be frozen, so buy in bulk when on sale and freeze the extras.
Oils

- Focus on using oils with healthy monounsaturated fats:
  - Olive oil
  - Canola oil (most versatile, high smoke point)
  - Peanut oil

- Use oils with polyunsaturated fats in moderation:
  - Safflower oil
  - Sunflower oil
  - Corn oil
  - Sesame oil
  - Soybean oil

Use oils sparingly:
120 kcal & 14 g fat per tablespoon
Non-fat cooking sprays can be used to minimize calories while cooking.

Junk Foods

- Avoid junk food
  - It’s high in calories
  - Junk food can be expensive
  - These snacks can really blow the budget
  - Too much junk food can lead to unhealthy habits
  - Or worse:
    - Extra pounds
    - Stomach problems

Snacks

- Pre-made snacks are convenient but are a big waste of money
- Buy whole ingredients and prepare your own
- By preparing snacks yourself you will not only save money but also know what you are eating
- Lower calorie & fat choices:
  - Light or low-fat popcorn
  - Soy or rice crisps
  - Trail mix
Prepared Foods

- Avoid frozen dinners or prepared entrees as much as possible
  - Many of these foods cost way more than the ingredients needed to prepare your own
  - These foods are less nutritious
  - Contain preservatives, extra sodium, and fat
  - May lack adequate vegetables
  - Only provide one meal for your family
  - Buying fresh usually provides more than one meal
  - Often leave you hungry

- Healthier meals generally contain <400 kcal, 15 g fat, 800 mg sodium

Water

- Drink water instead of soft drinks and juices
  - Soft drinks and juices can be expensive as cutting back on these drinks can help your budget
  - Sodas and juices contain a lot of sugar
  - Provide empty calories
  - Water is the best way to go
  - Make your own vitamin water
  - Add fresh fruit and herbs and let soak overnight
  - Choose coffee & tea without sugar
  - Plain seltzer with 1 oz juice

Using reusable water bottles helps reduce trash and is also cheaper in the long run.
Leftovers

- Utilize leftovers
  - Don’t waste leftovers
  - Use leftovers to prepare lunches for the week
  - Plan a night or two a week to have leftovers for dinner
  - You can also freeze leftovers and have dinners for a later date

Crock Pot Meals

- Crock pot meals are easy to prepare and usually require few ingredients
  - You can prepare most ingredients beforehand and freeze them for future meals
  - Can help you cut back on eating out
  - Quick and easy to prepare
  - Do not have to watch: Set & Go
  - Utilizes cheaper cuts of meat such as roasts
  - Slow cooking & low temperature tenderizes the meat
Slow Cooker Apple Cinnamon Oatmeal
Serves: 4
Total cost: $3.76 or $0.94/serving

<table>
<thead>
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<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Steel cut oats</td>
<td>1 c.</td>
<td></td>
<td>$6.69</td>
</tr>
<tr>
<td>Water</td>
<td>4 c.</td>
<td></td>
<td>$0.21</td>
</tr>
<tr>
<td>Nonfat half and half</td>
<td>½ c.</td>
<td></td>
<td>$0.46</td>
</tr>
<tr>
<td>Brown sugar</td>
<td>2 lg.</td>
<td></td>
<td>$0.64</td>
</tr>
<tr>
<td>Butter</td>
<td>¼ c.</td>
<td></td>
<td>$0.08</td>
</tr>
<tr>
<td>Vanilla</td>
<td>½ tsp.</td>
<td></td>
<td>$0.07</td>
</tr>
<tr>
<td>Cinnamon, ground</td>
<td>1 Tbsp.</td>
<td></td>
<td>$0.42</td>
</tr>
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</table>

The night before place a medium oven safe dish in a large slow cooker. In the oven safe dish together steel cut oats, water, half and half, brown sugar, vanilla, butter, and cinnamon. Create a water bath in the slow cooker by adding water to the slow cooker until the water line is equal to or less than the oatmeal line in the oven safe dish. Make sure water line does not go above the oatmeal line of the inner dish. Set slow cooker to low and let cook for 6-8 hours. Top with additional fruit or additional milk.

Note: Oatmeal can be made directly in the slow cooker without water bath but should only be cooked for 5 hours over low heat and needs to be occasionally stirred to keep from burning.

Quick and Easy
• Try to keep ingredients on hand for meals that are quick and easy to prepare
• With quick and easy meal ideas you will be less likely to pick up fast food for dinner
BLT with Pesto and Tomato Soup
Serves: 4
Total Cost: $5.95 or $1.49/serving

- 8 slices Whole wheat bread $1.98/20 oz
- 8 slices Bacon, turkey $2.98/12 oz
- 1 Large Tomato, sliced into 4 slices $1.25/lb
- 4 Romaine leaves $1.58/head
- 4 Tbsp. Pesto sauce $2.78/10 oz
- 2 (10.25 oz.) Tomato soup $0.75/can
- 2 c. Milk, skim $2.98/gal

Divide 4 Tbsp. of pesto sauce between 4 slices of bread. Top each slice of bread with 1 slice tomato, 2 slices bacon, 1 romaine leaf and remaining slice of bread. Heat dry skillet to medium high and brown sandwiches on each side. Heat soup and skim milk over medium heat until boiling.

Note: Whole wheat bread can be substituted for any sliced bread; turkey bacon can be substituted for regular bacon.

Freeze, Freeze, Freeze
• Cook one day a week and freeze for weekday meals
• Plan 5 or 6 freezable dinners and cook them all at once
• Take them out of the freezer the night before so dinner is ready to go when you get home
• Quick lunch option for work
• Double recipes and freeze the second portion
• Double a recipe of whole wheat waffles and freeze the leftovers for breakfast during the week
Whole Wheat Blueberry Pancakes

Serves: 4
Total Cost: $4.72 or $1.18/serving

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<th>Quantity</th>
<th>Unit Cost</th>
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<tbody>
<tr>
<td>All-purpose flour</td>
<td>1 c.</td>
<td>$1.92/5 lbs.</td>
<td>$0.19</td>
</tr>
<tr>
<td>Whole wheat flour</td>
<td>1 c.</td>
<td>$3.64/5 lb.</td>
<td>$0.37</td>
</tr>
<tr>
<td>Sugar</td>
<td>2 Tbsp.</td>
<td>$2.62/4 lbs.</td>
<td>$0.04</td>
</tr>
<tr>
<td>Baking powder</td>
<td>2 tsp.</td>
<td>$1.28/8.1 oz.</td>
<td>$0.11</td>
</tr>
<tr>
<td>Baking soda</td>
<td>1 tsp.</td>
<td>$0.52/16 oz.</td>
<td>$0.01</td>
</tr>
<tr>
<td>Salt</td>
<td>½ tsp.</td>
<td>$0.42/26 oz.</td>
<td>$0.01</td>
</tr>
<tr>
<td>Buttermilk</td>
<td>2 c.</td>
<td>$1.93/32 oz.</td>
<td>$0.97</td>
</tr>
<tr>
<td>Eggs</td>
<td>2</td>
<td>$1.78/dozen</td>
<td>$0.30</td>
</tr>
<tr>
<td>Oil</td>
<td>¼ c.</td>
<td>$1.28/16 oz.</td>
<td>$0.16</td>
</tr>
<tr>
<td>Blueberries</td>
<td>6 oz.</td>
<td>$3.23/12 oz.</td>
<td>$1.62</td>
</tr>
<tr>
<td>Sugar free maple syrup</td>
<td>8 oz.</td>
<td>$2.87/24 oz.</td>
<td>$0.94</td>
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Preheat griddle to 450 degrees. Combine flour, sugar, baking powder, baking soda and salt. Gently toss blueberries into dry ingredients. In separate container combine buttermilk, eggs and oil. Gently fold wet ingredients into dry ingredients, being careful not to over mix. Spread griddle with cooking spray, using a 1/3 cup measuring cup, ladle batter onto griddle. When pancake edges are dry and when it is no longer bubbling, about 2-3 minutes, flip and cook for additional 2-3 minutes. Top with 2 Tbsp. sugar free maple syrup.

Note: Fresh blueberries can be supplemented for frozen blueberries when in season. Double recipe and freeze leftover pancakes for breakfast during the week.

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Restaurants

• Going out to eat can take a big chunk out of your food budget
• Eating at home is always cheaper and more nutritious
• By planning your dinners and bringing your lunch to work you can save a ton of money
• If you enjoy eating at restaurants, make a separate budget for eating out

Hand out grocery lists and pantry list.
Summary

- Both fresh and frozen produce are nutritious
- Choose lower fat varieties of meats & dairy foods
- Choose healthy oils and spreads
- Fat free may not mean reduced kcal
- Plan ahead to stay on Budget
- Be sure to read food labels
- Get Creative & Make Healthy Eating Fun

Thank You!
Maybe you never gained weight during the holidays in your 20s or 30s, but as you get to your 50s and 60s, you may notice some pounds coming on.

Why is this happening? It is true that your metabolism slows down a tiny bit each year with increasing age. However, the main cause of this is decreased muscle mass. So, if you stay active, it is possible to maintain your current metabolism or your body’s ability to burn calories. Most people know that if they cut back on their food and move their body a little more, they can lose weight.

But what actually is causing the weight gain? The weight gain is caused by calories. To you and me, calories are the energy in food that can contribute to weight loss or gain.
Remember 1 lb of fat has 3500 calories! One piece of pumpkin pie has 545 calories, if purchased from Bob Evans. So just eating one piece of pie a few days a week can really add on the calories that contribute to small amounts of weight gain over time. If you do have a piece of pie, try to limit yourself to one piece and watch the portion size as well, because every bite has calories. Leaving a bite on the plate can help save the waistline.

Face it no matter what holiday it is in America, food is everywhere. We tend to overeat, some of us need to unbutton the top portion of our pants, and others feel guilty and depressed. This presentation will try to prepare you for holidays by offering you tips, tricks, and techniques to help you prepare healthier foods and eat better during the holidays.
First, ask yourself: Do you live to eat or do you eat to live? Many people think that they need more food than they do, hence the obesity epidemic in America. However our bodies were designed so that we eat to live, not live to eat.

If you are on a particular diet, nothing is wrong with eating special, different, or forbidden foods on special occasions.
You can manage weight during the holidays two different ways—portion control or substitution. Look at the first example—one Oreo® Cookie has 50 calories. Therefore, if you ate the two-cookie portion on the left you would consume 100 calories, while the four-cookie portion on the right would have 200 calories.

According to A.D.A.M., the average 150-lb woman would have to walk 22 minutes at 4 miles per hour (mph) just to burn off the difference of 100 calories.

Your second option is substituting. Did you know that you can buy fat-free hot dogs? Not only are they fat free, but you save 120 calories and 16 grams (g) of fat for every hot dog by making the fat-free switch. Fat-free bologna and fat-free mayonnaise are other good examples. However, not all fat-free products are that much lower in calories; so, check the food label to make sure.


How important is it for you to manage your weight during the holidays? Pick a number from 1 to 10, where 10 is extremely important and 1 is no so important? Based on this scale, where do you fall? How important is it for you to manage your weight?

Maybe the goal this holiday season is not to lose weight during the holidays, but to maintain your current weight!

Once you know how important it is to you now, you can set realistic goals for success. Now we will review some tips, tricks, and
techniques to help you manage weight during the holiday season.

The holidays are coming. How are you going to handle the gorgeous, fattening foods that inevitably accompany every party, gathering, or event? Food is a big and wonderful part of the holiday tradition. From Thanksgiving to New Years.

Learn to deal with the mass quantities of fattening food by getting to the root of the holiday munchies.

Focus on holiday activities, not holiday food. Try ice skating, go caroling, or read a favorite holiday book. Start your own traditions. Instead of focusing on baking and cooking traditions, make a new tradition surrounding an activity, such as making your own wreath.
Are Trick-or-Treaters Growing?

Approximately 30% of adults in the United States are either overweight or obese. About 30% of children ages 2-19 are overweight or obese.

Keep the entire family active during this holiday season:
• Park further away from your destination
• Get off of the bus one stop earlier, so you can walk those extra steps
• Go for a short walk after dinner
• Plan your weekend to include one activity/day
• Pace back and forth while on the telephone
• Schedule 20-60 minutes of activity time outside before watching TV
• Open up the family room for dancing, a game of Twister®, or a friendly Wii™ competition
• Do family exercises using weights (soup cans or water bottles) and/or stretch during favorite TV shows
• Play one active video game for every sedentary one

Help Children Maintain a Healthy Weight

• Offer treats such as stickers, pencils, Play-Doh, glow sticks, or miniature candy bars
• Introduce the Switch Witch, who comes at night like the Tooth Fairy and replaces the child’s candy with toys
• Have children sell back their candy to their parents for money or books

One way to help children maintain their weight is to hand out nonfood treats for Halloween, such as stickers, pencils, Play-Doh, and glow sticks.

Some parents are finding creative ways to prevent their child from gobbling down all of that candy. One idea is the Switch Witch. She comes at night, like the Tooth Fairy but on Trick or Treat night, and replaces the child’s candy with toys. The more candy the child puts out, the bigger the toy. Other parents allow their children to sell back their candy to them for money or books. Nothing is wrong with candy, but portion control and moderation are healthy habits to help shape the weight of tomorrow’s child.

For you to maintain your weight...
during Trick or Treat, try not to eat the candy you hand out. If you tend to eat all the Halloween candy before Trick or Treat night arrives, wait until the day before Trick or Treat night to purchase your candy. Another idea is to give away your leftover candy after Trick or Treat night.

Thanksgiving is the harvest festival in November. Regardless of whether you cook or not, you have control over the portions that you eat. Some items are less healthy than others. What can you do to eat a little healthier this Thanksgiving?

• Skip the butter with your bread
  • Do not eat turkey skin
  • Opt for white meat vs dark meat
  • Go slow or low on salad dressing
  • Take only one small piece of pie (buy no-sugar-added pie filling)
For example, look how much you can save by simply opting for white turkey meat with no skin! You can save for a 4-ounce (oz) serving. According to an ADAM calorie burner calculator, a 120-lb person would have to walk 24 minutes at 4 miles per hour (mph) just to burn these 86 calories! That is the difference between dark meat with skin vs white meat without skin.

Food labels obtained from www.calorieking.com.

The next holidays are Christmas, Hanukkah, and Kwanzaa. No matter which one you celebrate food seems to be part of the celebration.
Portion control and substitution also can work during the holidays. Eat reduced-fat kielbasa or take a smaller portion of rice. Save 68 calories by having one third less cup of rice—1 C of cooked rice has 205.

The problem with calorie containing drinks is that they don’t signal our fullness cue’s. They don’t register as food. We end up adding these calories on top of what we eat. This can lead to weight gain.
Get a middle piece of the cake instead of a corner piece and save calories. Limit the icing you eat or pick the smallest piece.

**Going to a party?**
Do not starve yourself all day so you can eat more at the party. You will end up eating high-fat foods to compensate.

Need to take a dish? Bring something healthy, such as a fruit tray, vegetable dish, couscous, or low-fat vegetable lasagna.

Sometimes the problem with parties is that the desserts are laid out with the main meal—go for the healthy foods before diving into the desserts. Eat a variety of foods in smaller quantities. Want to munch on something? Hang out next to the fruit and vegetable trays. Remember that your choice of beverage can make or break your entire day.

Adopt a new holiday philosophy that will change your life and your holiday eating habits. Take control and give up or replace a few of your holiday traditions. Whether it is stress-inducing events or great grandma's meat pie, ask yourself, "Do I really need it this year?" *Remember your scale of importance*
The three T’s
To help manage your weight during the holidays:
• Tips
• Tricks
• Techniques

Now we will look those tips, tricks, and techniques that can help you manage your weight during the holiday season.

Holiday Recipe Modification
• Alter recipes to reduce fat and calories
• Substitute skim milk and low-fat sour cream for higher-fat products
• Look at the calories and fat you can save by making small changes
Switching ingredients sometimes changes the texture and mouth feel of the item. However, you can modify many recipes to take out many of the calories and fat grams without anyone noticing. Only trial and error will show you how to make a successful recipe. I encourage you to experiment with these items, because decreasing fat and calories can help you manage weight for the rest of your life. Sometimes the changes are less noticeable if you substitute only half of the fat with a nonfat alternative. You can even use ½ cup (C) of unsweetened apple sauce to replace ½ C of oil in some recipes, saving you 880 calories and 104 g of fat!

**Slide 20**

<table>
<thead>
<tr>
<th>Holiday Recipe Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Try switching from:</td>
</tr>
<tr>
<td>• Evaporated milk (whole) to evaporated milk (skim)</td>
</tr>
<tr>
<td>− Save 191 calories and 24 grams (g) of fat for 12 fluid ounces (fl oz)</td>
</tr>
<tr>
<td>• Heavy cream to evaporated skim milk</td>
</tr>
<tr>
<td>− Save 600 calories and 80 g fat for every cup</td>
</tr>
<tr>
<td>• Butter or margarine to fat-free butter spread</td>
</tr>
<tr>
<td>− Save 95 calories and 10 g fat/tablespoon (Tbsp)</td>
</tr>
</tbody>
</table>

**Slide 21**

<table>
<thead>
<tr>
<th>Holiday Recipe Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Try switching from:</td>
</tr>
<tr>
<td>• Regular cream cheese to lite or fat-free</td>
</tr>
<tr>
<td>− Save between 40-70 calories and 5-10 g of fat/1 oz</td>
</tr>
<tr>
<td>• Regular ground beef to 93% lean ground turkey or 92% lean</td>
</tr>
<tr>
<td>− Save 180 calories and 22 g fat/4 oz</td>
</tr>
</tbody>
</table>
Holiday Recipe Modification
Try:
• Reducing oil in recipes
• Saves you approximately 110 calories and 13 g fat for every tablespoon reduced
• Use applesauce or banana puree to assist with moistness

Little Extras Add Up!
Cutting a mere 100 calories/day will allow you to lose (or not gain) 10 lb in 1 year.

This picture is 1 Tbsp of butter—100 calories, 11 g fat. Lite butter spread has 5 calories, 5 g of fat. Fat-free butter spread has 5 calories and not fat. Save 95 calories for every tablespoon consumed by using lite or fat-free butter for the rest of your life!

Smart Balance® and Promise® also make fat-free butter spread. However, always read the label. Not all varieties of I Can't Believe It's Not Butter®, Promise, or Smart Balance are fat free. Only the ones with no fat and 5 calories/tablespoon are fat free.
Slide 24

Take Time to Plan

- Plan what you will take to parties
- Pick your ingredients wisely

vs

Planning ideas:
- Bring the vegetable tray to the holiday parties
- Pick your ingredients wisely for other meals and holiday treats
- Use evaporated skim milk vs evaporated whole milk—you will save 191 calories and 24 g of fat in every 12-fl-oz can

Slide 25

Use substitutes

- Bring your own salad dressing, diet soda, and low-fat or low-salt condiments
- Reduce those calories by understanding how many calories and how much fat you can save
What does this mean to You?

- Switching from 2 Tbsp regular ranch dressing to 2 Tbsp fat-free Italian dressing saves you 265 calories.
- Walking 1 hour at 4 mph, 8000 steps, burns 273 calories for a 150-lb person.
- Switching from regular soda to diet will save you about 150 calories/12-fl-oz can.
- Walking 30 minutes at 4 mph (4000 steps) burns 136 calories for a 150-lb person.

No People Pleasing

- Eat only what you desire.
- Do not eat as an obligation to others, even if they have cooked your favorite dish.
- Make sure you make your own decisions—you are the one who will have to live with the consequences.
- Stand up for yourself—others may actually respect you for it.
- Be assertive—turn down certain extra helpings of food without feeling guilty.

Adapted from: Holiday Eating Survival Tips (Gronick-Ilagan, 2009)
With all the food around, try to keep busy. Offer to help wrap gifts or hang decorations. Many people snack when they are bored; so, keeping busy will keep you away from unneeded calories.

When at a party, carry your appetizers on a napkin, not a plate. People are more likely to fill up a plate, even if they are not hungry. Stick with the napkin. You can not carry as much food on it.

If you do end up with the “not me” plate, cut food one piece at a time, take small bites, and eat slowly. If the first thing you do is cut up your entire piece of meat, you are more likely to eat the entire thing. Cut one piece at a time and eat slowly. You will get a better idea of when you are full and are more likely to stop eating before you overdo it.

Choose To Eat Healthy Ahead of Time

• Focus on fruits and vegetables
• Do not forget to eat breakfast
• Do not think: “I already blew it. I might as well blow it more.”
No Skipping Meals

This will only result in a binge at mealtime and a spiral of guilt and hopelessness.

Many times, if people have a party to go to at 8 PM, they do not eat dinner because they know that the party will include food. However, eating something small at your dinner time (6 PM) will help you manage your weight and control your portions while at the party.

Visualize

- Visualize yourself eating healthy prior to attending the holiday meal
- Walt Disney once said, "If you can dream it, you can do it."
**Stay Focused**

- Know what you are doing
- Keep a journal

**The Consequences of Nibbling**

- Watch what you eat before or after the main meal
- For example, look at what was consumed at this party:

<table>
<thead>
<tr>
<th>Item</th>
<th>Calories</th>
<th>Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular soda pop</td>
<td>150</td>
<td>0 g</td>
</tr>
<tr>
<td>23 almonds</td>
<td>165</td>
<td>14 g</td>
</tr>
<tr>
<td>Handful of chips (1 oz)</td>
<td>155</td>
<td>10 g</td>
</tr>
<tr>
<td>Handful of Chex® mix</td>
<td>140</td>
<td>4.5 g</td>
</tr>
<tr>
<td>Regular soda pop</td>
<td>150</td>
<td>0 g</td>
</tr>
</tbody>
</table>

**TOTAL**: 760 calories, 28.5 g fat
Mint Flavored Gum & Mouthwash
• While preparing food, chew gum
• Instead of seconds, try some mouthwash first

Stop Eating
• Stop eating when you are physically full
• Start learning how to recognize the difference
• Take a time-out when you think things are getting out of control

Physical Hunger
Emotional Hunger
Know the Truth

• Putting a couple of pounds on will not cause you to go back to square one
• You have already learned what is healthy
• No one can take that away from you

After the Holidays

• Resume your lifestyle of balance and wellness just after the holiday has passed
• Change your thinking, if you need to
• Do not think, “I already blew it, so I might as well blow some more.”

Adapted from: Holiday Eating Survival Tips (Gronick-Illagan, 2009)
THANK YOU!
APPENDIX E: OUTLINES OF POWERPOINTS FOR GROUP B

Nutrients:

- Carbohydrate
  - 4 kcal/g
    - Fuel
- Fat
  - 9 kcal/g
    - Fuel
- Protein
  - 4 kcal/g
    - Tissue maintenance and repair
    - Minor fuel source
- Vitamins & Minerals
  - Coenzymes in Energy Metabolism

Carbohydrate Classification:

- Simple
- Complex

Whole Grains

Why eat whole grains?

- Nutrient rich
- Reduces risk of heart disease and digestive issues
- High in fiber
- Helps with weight management

Whole Grain Examples: oatmeal, whole cornmeal, brown rice

Goal: Make at least half your grains whole

Tips:

Use brown rice or whole wheat pasta
Choose whole-grain bread for sandwiches
When making pancakes substitute half of the recipe with whole wheat flour
Snack on whole grain crackers or air popped popcorn

Fruits

- A diet rich in fruits may lower risk of cancer, diabetes and heart disease
- Provides a good source of vitamins and minerals
- Good source of fiber

Goal: Make half your plate fruit and vegetables

Tips:
• Keep a bowl of whole fruit on counter, table or refrigerator
• Buy fruit in season. They are at their peak in nutrition and are cheaper
• Add fruits to food, instead of sugar
• Pack whole fruit with a lunch
• Top a salad with favorite fruits

Vegetables
• A diet rich in vegetables may reduce risk of diseases such as stroke, heart disease, type 2 diabetes and cancer
• They are low in calories, but high in vitamins, minerals, and antioxidants
• The fiber and water content in vegetables helps make us feel full longer
• Excellent source of antioxidants

Goal: Make half your plate fruits and vegetables

Tips:
• Fresh and frozen vegetables can be cooked quickly in the microwave
• Vary your vegetables by eating vegetables that are red, orange or dark green
• When eating outside, substitute fried sides with a side of vegetables
• Frozen vegetables are just as nutritious as fresh vegetables
• Vegetables in season taste their best, while also being at a lower cost

Dairy
• Intake is linked to improving bone health and may reduce risk of osteoporosis
• May reduce risk of cardiovascular disease, type 2 diabetes and lower blood pressure
• Dairy is rich in calcium, potassium, vitamin D and protein

Goal: Incorporate fat-free or low-fat dairy into your diet

Suggestions for dairy:
• Switch to fat-free or low-fat (1%) milk
• Choose low-fat cheeses and fat-free yogurt options
• Add fat-free or low-fat milk to hot cereal or oatmeal, instead of water
• Use skim milk instead of cream in coffee
• Use plain fat-free Greek yogurt instead of sour cream

Protein
• Serves as the building block for bones, muscles, blood, skin, enzymes, vitamins and hormones
• Lean meat, dry beans and peas are rich in protein
• Protein foods are high in B vitamins, which help with a variety of functions in the body
• Meat and beans provide minerals such as iron, magnesium and zinc
• Avoid meats high in saturated fats -- which contributes to increased risk of heart disease
• Consuming fish, nuts and seeds is a great way to get protein, healthy fatty acids and vitamin E

**Goal:** Choose lean meat, poultry and seafood

**Tips:**
• Choose lean or low-fat meat and poultry
• Watch out for preparation methods (i.e. fried, oil content, butter)
• Seafood is high in healthy omega-3 fatty acids
• Processed meats have added sodium
• Choose unsalted nuts and seeds for a snack

**Oils & Fats**
• Oils and fats are essential in helping with digestion, metabolism and vitamin absorption.
• Limit intake of trans and saturated fats: replace them with monounsaturated and polyunsaturated fatty acids
• Use oils to replace solid fats when possible

**Empty calories**
• Empty calories are calories from food with solid fats and/or added sugars, while having little to no nutrient value.
• Food examples of empty calories: cakes, donuts, sausage, bacon, pizza, ribs
• Drink examples of empty calories: soda, energy drinks, sports drinks, fruit drinks
• Substitute empty calories with healthier options

**Build a Better Meal**
Use MyPlate as a model to build a healthy and balanced meal including:
• vegetables
• fruit
• whole-grains
• protein
• dairy
• Limit: fat and sugar

**Vitamins & Minerals**
• Vitamins and minerals do not provide energy by themselves; rather, they enable the release of energy from food. They also serve vital functions such as:
  o Vitamins and minerals act as catalysts
  o Are involved in oxygen delivery to muscles and tissues
- Are incorporated into body structures (bone)
- Help with the healing process (collagen)
- Protect tissues against damage
- Protect cells and affect overall health
- Vitamins, minerals, and antioxidants work synergistically
- Foods supply the correct amount your body needs
- Some supplements can have such high amounts that over time these can become toxic
- Quantity does not equal quality
- Supplements contain some but not all nutrients
- We just have not identified all of them!
- Fruits, vegetables, and whole grains provide phytochemicals
- Isolated forms (supplements) have been shown to be toxic

**Essential Vitamins**

- B-vitamins: support energy metabolism, nerve function, digestive system, DNA formation, vision and skin health
- Vitamin C: needed for collagen synthesis, amino acid metabolism, helps iron absorption, supports immune function, protects cells from oxidative damage
- Vitamin A: supports vision, skin, bones and teeth, supports immune function, and reproductive health
- Vitamin D: Promotes bone mineralization, supports heart health
- Vitamin E: antioxidant, regulates oxidation reactions, supports cell membrane stabilization
- Vitamin K: needed for the synthesis of blood-clotting proteins, regulates blood calcium, bone health

**Essential Minerals**

- Sodium: maintains fluid and electrolyte balance, supports muscle contraction and nerve impulse transmissions
- Zinc: part of many enzymes, involved in production of genetic material, protein synthesis and breakdown, transports vitamin A, support wound healing, reproductive health, development of the fetus
- Selenium: antioxidant, protects the body’s cells from oxidation, regenerates vitamin
- Iodine: component of thyroid hormones that help regulate growth, development and metabolic rate, plays a role in protein synthesis
- Copper: necessary for the absorption and utilization of iron, supports formation of hemoglobin and several enzymes, needed for collagen synthesis and for creating connective tissue
- Manganese: facilitates many cell processes
Benefits of Physical Activity

• Improve quality of life
• Reduce the risk of chronic disease
  o Coronary Artery Disease
  o Hypertension
  o Some Cancers
  o Type 2 Diabetes
• Enhance one’s mental well-being
• Promote healthy musculoskeletal function throughout life
• Cardiovascular disease
  o Leading health-related cause of mortality for men and women in the US
• Higher levels of cardiovascular fitness are associated with a 50% reduction in risk of CVD
• CVD prevention program includes
  o Physical activity
  o Heart Healthy Diet
  o Avoiding stress & depression
  o Not smoking
  o Healthy weight
• Diabetes, Insulin Sensitivity & Glucose Metabolism
  o Affects 170 million individuals worldwide
  o Largely due to inactivity and obesity
  o Physical inactivity weakens the body’s insulin regulatory mechanisms

• Regular aerobic activity increases insulin sensitivity and glucose metabolism
• Resistance training improves glucose metabolism

• Hypertension
  o Elevated blood pressures are associated with a higher risk of developing CHD, CHF, & kidney failure
• Moderate-intensity aerobic exercise 3-5 times per week for 30-60 min is an effective way to manage hypertension
• Habitual aerobic exercise plays a protective role against the increase in blood pressure associated with aging
• Circuit training vs. weight training

• Blood triglycerides, HDL & LDL cholesterol
  o High levels of blood cholesterol is highly linked to incidence of CHD
  o HDL-C associated with reduced risk of CHD
  o Sedentary lifestyle contributes to development of CHD and unfavorable elevation of blood fats and cholesterol levels
• Physical activity plays an important role in decreasing these health risks
  o 15-20 miles/wk of jogging or briskly walking may decrease blood triglycerides by 5-38mg/dL as well as elevate HDL-C 2-8 mg/dL
  o Physical activity combined with healthy diet increases effect

• Cancer
o Physical activity & exercise are correlated with lower incidence of colon cancer and breast cancer
• 30-60 minutes of moderate physical activity results in up to a 40% reduction relative risk of cancer compared to inactive counterparts
• Physically active individuals may also have a lower risk of lung cancer
• Osteoporosis
  o Degenerative disease → loss of BMD → bone fractures and health problems
• Physical activity stimulates bone growth
  o Resistance training and weight bearing aerobic exercise may provide the stimulus for bone formation
  o Regular weight-bearing activity is effective at averting age-related bone loss
  o Weight bearing aerobic exercise 3-5 x wk + resistance exercise 2-3 x wk preserves bone health during adulthood
• Musculoskeletal Health & Sarcopenia
  o Muscle mass, strength, power and endurance are essential for the improvement of musculoskeletal health and movement.
  o Decrease in musculoskeletal health mainly due to inactivity and not solely age
• Sarcopenia
  o Age-related loss of muscle mass and strength
  o Loss of muscle strength → loss of independence, increase in falls, fractures, decrease in metabolic rate
• Daily physical activity incorporating large muscles improves musculoskeletal health & prevents sarcopenia
• Body composition & obesity
  o Most favorable approach to weight loss includes committed endurance exercise, resistance exercise, & caloric restriction
• Weight loss achievements
  o Cardiovascular exercise
    • 200-300 accumulated minutes moderate-intensity
  o Resistance training and circuit training
    • 2-3 x week using major muscle groups
    • Maintains/increases fat-free mass
    • Encourages loss of fat mass

Where to start
• Engage in both aerobic and muscle strengthening activities

• Physical Activity Guidelines for Americans Recommend:
  o 2½ hours of moderate-intensity aerobic activity every week
  o Or
  o 1 hour and 15 minutes of vigorous-intensity aerobic activity
  o 2 or more days a week of muscle strengthening activities for all major muscle groups
• Start doing activities you like to stay active
• Work up to fitness goals slowly to prevent injury
• Designate weekly goals
• Plan out weekly goals over 3 to 5 days a week

Planning
• Set aside a block of time every day for planned activities
• Incorporate fitness into daily routines
• Park car at furthest parking space, take stairs, do sit-ups during commercial breaks
• Turn inactive periods to active periods

When to stop exercising:
• Feeling uncomfortable pressure, pain, squeezing or heaviness along the chest, neck, jaw or back
• What to do:
• Stop and sit or lie down
• If it does not go away after 2-4 minutes, go to emergency room
• If it does go away, let doctor know about the incident

Feeling severe nausea, shortness of breath, cold sweats, feeling lightheaded or irregular pulse/palpitations

• What to do: stop and sit or lie down
• If it does not go away in 5-10 minutes, call your doctor
• If it does go away, let doctor know about the incident

Aerobic Activity examples

Moderate-intensity: At this rate, you should be able to talk, but not sing the words to your favorite song
• Walking fast
• Water aerobics
• Riding a bike on a flat surface (< 10 mph)
• Ballroom dancing
• Gardening

Vigorous-intensity: At this rate, you won’t be able to say more than a few words without pausing for breath
• Jogging or running
• Race walking
• Swimming laps
• Riding a bike fast or on hills (> 10 mph)
• Playing basketball
• Jumping rope
**Muscle-strengthening activities examples**

- These activities are weight-bearing activities that strengthen muscles
- Activities should vary to work all of the major muscle groups in the body
  - Legs
  - Hips
  - Back
  - Chest
  - Abdomen
  - Shoulders
  - Arms

Try to do 2-3 sets of 8-10 repetitions to get maximum health benefits
Allow at least 24-48 hours of rest between working the same muscle group again

**Record Keeping**

**Purpose & Importance**

**Awareness**

Is a key step in changing habits. The awareness you gain from record keeping has several benefits these include:

- You learn about calories. There are calories lurking where you least suspect. For example, most people think yogurt is a good diet food. However, some yogurts can have more calories than an ice cream cone. Ten innocent potato chips contain 110 calories, more than five cups of plain popcorn. Becoming an expert insures you won’t be derailed by calorie surprises.
- You are aware of what you eat. You might be thinking, “of course I know what I eat.” However, one does not always recall the exact number of Doritos consumed at happy hour or the ounces of milk poured into the bowl of cereal. These are forgotten calories, sometimes because we like to forget them!
- You increase control over eating. Knowing exactly where you stand with the day’s calorie count permits you to judge whether you can afford certain foods. You may have the calories “banked” to have that snack you are considering. Knowing where you stand makes the choice easier.
- Eating patterns become clear. You may discover that most of your eating is done between dinner and bedtime. Another person might eat throughout the day. Some people eat when they have certain feelings (anger, anxiety, etc), and others find they eat when doing something else (watching TV). Knowing your patterns is a big help in changing habits.
- The records help you bank calories. Your body is like a bank account in which you make calorie deposits and withdrawals. If you eat less, you have some calories to bank for a special occasion. If you have a party to attend on the
weekend, you can cut back during the week and can afford to indulge with some special dessert. Calorie records give you the information to make such a decision.

- The weight change record prevents despair. There may be one or more weeks when you fail to lose weight, or even worse, gain weight! There are many reasons for this (we will discuss these later) Such a discouraging bout with the scales can make life difficult. Reviewing your change in weight over many weeks can prevent this despair. A slight gain is easier to tolerate when your records remind you that you have been losing weight in a steady manner.

- Research shows keeping a food journal is the one of the most important parts of habit change. It may be difficult at first or may become repetitive but it is important to keep this habit up.

The food diary

- Record everything: forget nothing. Every morsel of food goes in the diary. If you eat pretzels, count how many. Every ounce of food or beverage must be entered. Don’t forget when you taste food you are preparing, they count too.

- Record the food, the amount, the calories, what you were doing, how you were feeling. Record the type of food you eat, how it is prepared (baked, fried, etc), how much and the number of calories. Record where you ate, how hungry you were before you started eating, how you were feeling before and after you ate.

- Record immediately after eating. Do not wait until you are ready for bed, until the next morning, or even later! It is hard to remember how many peanuts you ate at the cocktail party or how much juice you had for breakfast. As soon as you finish eating, whip out your food diary and make your entries. If you are with others and are embarrassed, excuse yourself and find a private place like the ladies room.

- Carry the food diary always. There is food everywhere waiting to leap into your mouth. Keep your food diary with you so you won’t be caught unaware. Some people use a pocket notebook during the day and then transfer the information to their food diary later at home.

Portion Sizes

- The amount you eat and drink plays an important role in your energy balance strategy
  - Most people eat more when they are served larger portions
    - Choosing smaller portions can help you lose weight and keep it off
  - Portions have increased over time
Some common food portions contain the recommended allotment for the entire day!

For example some bagels weigh up to 5 oz – the entire day’s allotment of grains

- Measuring
  - A method of portioning food that involves the use of scoops, measuring cups, and spoons

- Weighing
  - A method of portioning food using a food scale. Used for foods such as meats and cheeses.

- Counting
  - A method used for counting servings such as chips, crackers & cookies

Reading Food Labels

- Serving Size tells you the size of 1 serving of the product.
- Servings Per Container tells you how many total servings there are in the container.
- Calories are for one serving. Take notice especially if you are watching your caloric intake.
- Saturated Fat - Try to limit these.
- Trans Fat - Less than 2 to none.
- Poly- & Mono- Unsaturated Fats - are healthy fats but are still calories.
- Cholesterol - limited amount.
- Sodium - limited amounts.
- Total Carb - Includes everything from sugar to fiber.
- Fiber - Helps to lower cholesterol and helps with satiety.
- The %DV show the percentage of each nutrient in a single serving. In accordance with daily recommendations.

Tips for controlling portions sizes

- Take at least 20 minutes to eat a meal.
- Make each bite a conscious one. This puts pleasure and enjoyment back into mealtime.
- Put your fork down between bites and chew food thoroughly before swallowing.
- Scoop less on each fork or spoonful no “preloading”.
- Eat without distraction (watching TV, driving, reading, computer).
- Many foods are low in calories even in large amounts.
- Examples include:
  - vegetables, fruits,
  - salads, broth soups.
  - Eat broth soup, salad with low fat dressing or a grapefruit before the meal.
- Use the 25:25:50 rule:
- Eat with smaller utensils, plates and bowls.
• Read food labels accurately.
• Use measuring cups, spoons and digital scales
• Serve everyone dinner then put the food away to avoid overeating
• Avoid ”meal deals”
• Share entrees with a friend or order from the appetizer menu
• Take half your meal to go

Nutrition Myths

Myth

_Fad diets work for long term weight loss_

“Loose 30 pounds in 30 days”

Fact

• Promises quick results
• Are hard to follow for extended periods
• May lose weight initially but it tends to return
• Generally unhealthy due to nutrient restriction
• Loosing more than 3 lbs / week increases risk for gallstones
• <800 kcal diets increase risk for heart rhythm abnormalities

Nutrition Tips:

• Moderate portions
• Build a physical activity plan
• Healthy weight loss suggestions
  o ½ - 2 lbs per week
• Don’t be fooled by flashy advertisements and celebrity endorsements
• Beware of too good to be true statements

Myth

_I can lose weight eating whatever I want_

Fact

• Need to use more calories than you eat
  o Remember the energy balance equation
• Either limit calories ”in” per day or increase physical activity

Nutrition Tips:

• Portion control
• Can still eat foods I love but total number of calories count
• Moderation is key
• Make sure to have a variety of nutrients
• Keep a food journal to keep track of everything you eat throughout the day

Myth:

*High Protein / Low carb diets are a healthy way to lose weight*

• Unbalanced diet
• May be eating too much fat and/or cholesterol = Increase risk of heart disease
• Too little fruits and vegetable = lack of fiber, vitamins & minerals
• Nausea, tired, weak from low carbohydrates
  o Carbohydrates = energy
• <130 g CHO can cause keytones and kidney injury
  o Increase risk of gout & kidney stone risk

Nutrition Tips:

• Reduced calories with recommended Fat, Protein & Carbohydrates
  o You can manipulate the amount of macronutrients you eat as long as you stay within the recommended percentages
• Greater variety leads to a greater chance of sticking with the plan
• Balanced diet doesn’t cut out any of the food groups
  o You don’t feel deprived
  o You don’t become deficient in nutrients

Myth:

*Starches are fattening and should be limited or avoided when trying to lose weight*

Fact:

• Many foods high in starch are low in calories and fat
  o However any nutrient eaten in excess can lead to an increase in fat accumulation
• Complex carbohydrates give the body energy
• What do you know to be a starch...

Nutrition Tips:

• Replace regular potatoes with sweet potatoes or yams
• Replace ½ your grain content with vegetables
• Eat a diet that:
  o Promotes fruits, vegetables, whole grains, fat-free/low-fat milk products
Incorporates meats, poultry, fish, beans, eggs and nuts
Is low in saturated fats, trans fats, cholesterol, salt and added sugars

Myth:

*Certain foods like grapefruit, celery, or cabbage soup, can burn fat and make you lose weight*

Fact:

- No food can burn fat
- Caffeine may speed up metabolism for short periods, but does not cause weight loss
- What other foods/methods have you heard ”burn fat”?

Nutrition Tips:

- Cut back on calories
- Be more physically active
- These are the best tools to lose weight

Myth:

*Natural or herbal weight-loss products are safe and effective*

Fact:

- Typically not scientifically proven as ”safe”
- Generally not FDA-approved
- Some herbal products have caused death
  - i.e. Ephedra
- Have you/do you know someone that has tried any supplements?
  - Side effects?

Nutrition Tips:

- Talk with your healthcare professional BEFORE you try any supplement
- Do your research!

Myth:

*Fat-free or low fat means no calories*

Fact:

- Often times have same amount or more calories from added sugars
• Added sugars, flour, starch, thickeners add calories
• Usually leave you less satisfied

Nutrition Tips:

• Read the nutrition label
• Check the serving size
• Let’s practice (practice makes perfect)

Myth:

Fast food restaurants are always an unhealthy choice and you should not eat them when dieting

Fact:

• Knowing how to incorporate them is key
• Do not have to be completely avoided
• Realistically, how can we do this? Have you ever tried to completely avoid fast / convenience food

Nutrition Tips:

• Avoid super-sized combos
• Split with a friend
• Choose water or fat-free milk instead of soda
• Try the “fresco” taco instead
• Fried foods should be chosen sparingly due to fat and calorie content
• Use small amounts of high-fat toppings/dressing
• Read the nutrition information on the restaurant’s website

Myth:

Skipping meals is a good way to lose weight

Fact:

• Skipping meals tends to make you feel hungrier, which makes you eat more
  ▪ Not intended for long-term weight loss
• Eating many SMALL meals throughout the day can help control appetite

Nutrition Tips:

• Eat small meals throughout the day
  o Fruits and veggies are full of water and fiber and can help you feel less hungry
• Eat a variety of foods
• Take snacks with you so you aren’t tempted by the vending machine
• Don’t wait longer than 3-4 hours between meals

Myth:

*Nuts are fattening and you should avoid them if you are trying to lose weight*

Fact:

• High in calories and fat
• However, nuts contain healthy fats
• Good source of protein, fiber and minerals

Nutrition Tips:

✔ Control your portions

• Chose raw or **dry** roasted
  • Typically roasted nuts have additional oils added to them this can increase the total fat and calories per serving
• ½ oz of mixed nuts has about 84 calories
• Good options:
  • Almonds
  • Pistachios
  • Walnuts

Myth:

*Dairy products are fattening and unhealthy*

Fact:

• Low-fat/fat-free options are just as nutritious as whole-milk products but with fewer fat and calories
• Dairy has several nutrients the body needs
  • Protein, calcium, Vit A & D

Nutrition Tips:

• Dietary Guidelines for Americans recommends 3 cups/day of low- or fat-free milk/milk products
• Look for fortified milk alternatives if lactose intolerant
  • Soymilk, Almond milk, Rice milk
• Use fat-free Greek yogurt in place of sour/heavy cream
Fad Diets

Paleo Diet/ Caveman Diet

- Based on what humans ate during the Paleolithic Era
  - Fish
  - Grass-fed meats
  - Fruits and Vegetables
  - Berries
  - Fungi
  - Roots
  - Nuts
- And excludes modern day foods
  - Grains
  - Legumes
  - Dairy products
  - Refined salts
  - Refined sugars
  - Processed oils

Pros

- Improvements in weight, BMI, waist circumference and blood pressure
- Reduction of insulin and total cholesterol
- Somewhat consistent with current dietary guidelines:
  - Eat less salt and added sugars
  - Eat more fruits, vegetables and lean protein

Cons

- Deficiency of Vitamin D and Calcium
- Increased exposure to environmental toxins from increased intake of fish
- Cost
- Scientific studies have mixed results on whether the paleo diet effects diabetes and heart disease
- Current research supports whole grains, low-fat dairy and legumes as part of a healthy diet

Cabbage Soup Diet

- **Day 1:**
  - Fruit Day: Eat all the fruit you want, except bananas, plus cabbage soup
- **Day 2:**
Vegetable Day: Eat all fresh, raw or cooked vegetables, except dried beans, peas or corn, plus cabbage soup
Dinner: Baked potato with butter

Day 3:
Fruit and Vegetable Day: Eat everything you ate on days 1 & 2 except the baked potato plus cabbage soup

Day 4:
Eat up to 8 bananas and skim milk plus cabbage soup

Day 5:
Beef and Tomatoes: Eat 10-20 oz. of beef and up to 6 tomatoes plus cabbage soup

Day 6:
Beef and Vegetables: Eat 2-3 steaks with leafy green vegetables plus cabbage soup

Day 7:
Brown rice, unsweetened fruit juices and vegetables plus cabbage soup

Who can see a problem with this long term? Do you think you could maintain this type of eating for longer than one week?

Pros
- Quick weight loss due to low calories
- Allows people to eat increase amounts of fruits and vegetables

Cons
- Limited food choices
- Boring
- Inadequate nutrition
- GI discomfort
- Hasn’t been shown to give long term weight loss
- Weight rebound

HCG Diet
- A diet consisting of 500 calories a day with under-the-tongue-drops or injections of hCG
  - hCG is a hormone produced during pregnancy
- The diet claims that hCG suppresses hunger and forces the body to use fat for fuel, allowing a person to lose several pounds a day

Pros
• There is no scientific evidence that supports hCG as a weight loss aide…No real pros

Cons

• The oral hCG may contain little, if any, hCG
• Weight loss is due to the very-low calories, not that hCG
• The FDA, the American Society of Bariatric Physicians, the American Medical Association and the Academy of Dietetics and Nutrition do not recommend or support hCG as a weight loss aid
• Nutritional deficiencies due to very limited calories

Atkins Diet/Low Carb Diet

• A diet that is low in carbohydrates and high in protein and fat
• The theory is that by consuming a low carbohydrate diet, your body doesn’t rely on carbohydrates for energy and instead burns its fat stores to result in weight loss

Pros

• It follows current recommendation on eliminating refined carbohydrates (cakes, sweets and white bread)
• The diet allows foods that most people like, such as, meat, cream cheese, butter and other high fat foods
• Dieters rarely go hungry because there is no limit on how much they can eat, just what they can eat

Cons

• It puts your body into a state of ketosis because of the decreased amounts of carbohydrates
• Supplementation may be necessary due to the dietary restrictions
• Side effects include:
  o Constipation
  o Dehydration
  o Bad breath
• Complications include:
  o Osteoporosis
  o Hypotension
  o Liver and kidney problems
• Ketosis
When the body uses up what carbohydrate it has in the bloodstream and stored in the liver, it begins to use fat as fuel, creating ketones. Fat and protein have main functions in the body, including building and repairing tissues and cells; they aren’t meant to be our main source of fuel. Important organs, such as the brain, need glucose to function—during prolonged periods to ketosis the body adjusts to use ketones as fuel for organs that require glucose.

Master Cleanse Diet
- A diet where the only food allowed is a lemonade made from lemons, pure maple syrup, cayenne pepper and water
- This beverage should be drank, a minimum of 6-12 times a day
- This diet should be followed for 10 days
- In addition to the drink, a laxative should be taken in the morning and in the evening

Pros
- There is no scientific evidence to support the Master Cleanse as a short term diet

Cons
- The diet is deficient in:
  - Vitamins
  - Minerals
  - Carbohydrates
  - Fats
  - Protein
  - Fiber
  - Calories
- May rob your intestines of healthy bacteria that aid in digestion and immunity
- Loss of lean muscle tissue
- Because your robbing your body of food, it is likely that a binge will occur after you are done with the diet—which will cause you to regain the weight plus more

Conclusion:

Diet & Exercise – The Tried and True Method!

Nutrient Density & Functional Foods

Vitamins
- Organic compounds that the body needs to grow and develop normally
Each vitamin has a specific job in the body:
- **Vitamin A**: vision
- **Vitamin E**: immune system
- **Vitamin K**: blood clotting

**Minerals**
- A naturally occurring substance that are necessary for many jobs in the body, such as building bones, making hormones and regulating your heartbeat
- Each mineral has a specific job in the body:
  - **Calcium**: muscle contraction
  - **Iron**: Help carry and store oxygen in the body
  - **Sodium**: Fluid balance
  - **Potassium**: Fluid balance, bone health, cardiovascular function

**Phytochemicals**
- Compounds produced by plants that have an antioxidant or hormone-like effect in the body
- Generally have protective or disease preventative properties
  - **Carotenoids**
  - **Flavonoids**
  - **Isoflavones**
  - **Phenolic acids**

**Carotenoids**
- Includes:
  - Beta-Carotene
  - Lutein
  - Lycopene
- Produces deep green, yellow, orange and red pigments in fruits and vegetables:
  - Carrots
  - Pumpkin
  - Sweet potatoes
  - Tomatoes
  - Papayas
  - Broccoli
  - Kale

**Flavonoids**
- Includes:
- Epicatechin
- Hesperidin
- Isorhamnetin
- Kaempferol
- Quercetin

- Health-promoting effects include:
  - Anti-allergic
  - Anti-cancer
  - Antioxidant
  - Anti-inflammatory
  - Anti-viral

- Sources:
  - Fruits
  - Teas
  - Soybeans

Isoflavones

- A class of phytoestrogens - plant derived compounds with estrogenic activity
- Includes:
  - Daidzein
  - Genistein

- Sources:
  - Legumes
  - Soybeans
  - Soy products

- Benefits:
  - Anti-carcinogenic
  - Anti-atherogenic
  - Anti-osteoporotic

Phenolic Acid

- Includes:
  - Capsaicin
  - Ellagic acid
  - Gallic acid
  - Rosmarinic acid
  - Tannic acid

- Sources:
  - Walnuts
  - Strawberries
- Chili peppers
- Mangos

- Benefits:
  - Anti-oxidant
  - Anti-inflammatory

**Antioxidants**

- Substances that help protect and repair cells from damage caused by free radicals
  - **Free radicals**: molecules produced when your body breaks down food or by environmental exposures like tobacco smoke and radiation
- Antioxidants can be vitamins, minerals or other naturally occurring compounds in foods:
  - **Vitamin E**
  - **Selenium**
  - **Lycopene**

**Antioxidant Vitamins**

- **Vitamin E**
  - Green leafy vegetables
  - Legumes
  - Nuts and seeds
- **Vitamin C**
  - Citrus
  - Red and green peppers
  - Tomatoes
- **Beta-carotene (Vitamin A)**
  - Liver and egg yolks
  - Carrots
  - Yams

**Antioxidant Minerals**

- **Selenium**:
  - Tuna
  - Beef and poultry
  - Fortified breads and other grain products
- **Zinc**:
  - Oysters and seafood
  - Beef and poultry
  - Beans and nuts
  - Dairy products
  - Fortified cereals
Other Antioxidants

- **Quercetin:**
  - Apples
  - Red wine
- **Leteolin:**
  - Celery
  - Green bell peppers
- **Catechins:**
  - Tea
- **Lycopene:**
  - Tomatoes
  - Guavas
  - Asparagus
- **Lutein**
  - Kale
  - Turnip greens
  - Spinach
  - Broccoli

**Nutrient Density vs. Energy Density**

**Nutrient Density** refers to the ratio of good-for-you nutrients that a food contains to the amount of energy it provides.

- Nutrient dense foods provide
  - Vitamins
  - Minerals
  - Fiber
  - Antioxidants and Phytochemicals

**Energy Density** provides little or no essential nutrients and are full of calories.

- Energy dense usually contain more
  - Sugar
  - Fat

**Nutrient Density & Weight Management**

In order to lose weight we need to eat fewer calories. This can leave us feeling hungry because we are eating less food. Eating the same or more VOLUME while eating less ENERGY can help solve both these issues. Fill up on foods that have low energy density and eat less food with high energy density.
Nutrient Dense Foods with Low Energy Density

Very low-density foods are usually high in fiber and water content.

- Non-starchy vegetables
- Nonfat milk
- Soup broths

Low-density foods are slightly higher in carbohydrate and/or calories

- Starchy fruits and vegetables
- Grains
- Low fat meat
- Legumes
- Chili

The basic principles of eating more volume for less calories is:

- Reduce fat
- Add fiber
- Add water
- Add fruits and vegetables

By increasing the volume of food, you will consume fewer calories, enjoy a satisfying portion of food, and keep hunger in check!

How to Increase Volume In Your Meals

Add water to the dishes you cook

- Make soup, stews and casseroles
- Start meals with broth-based, low-fat soups
- Dilute fruit juice with water or soda water

Add fruit to increase water and fiber

- Choose whole fruits, fruits canned in water or juice, and frozen fruit
- Start your meal off with fruit. Half a fresh grapefruit or an apple as an appetizer
- Add fruit to your favorite yoghurt or cereal
- Add berries, pears, apples, or mandarins to your salads
- Substitute applesauce, banana or pumpkin puree to baked goods

Add vegetables to increase water and fiber

- Start your meal with a salad, raw vegetables, or a clearer broth soup that has lots of vegetables
- Try drinking green smoothies or juices
- Snack on raw veggies such as cauliflower, broccoli, carrots, celery
- Add vegetables to your cooked dishes
- Substitute vegetables for half the grain in dishes

**Fiber** is found only in plants such as fruits, vegetables and grains

**Key Benefits**

- Helps keep us “regular” and prevents constipation
- Might help protect against certain diseases such as:
  - Diabetes
  - Heart disease
  - Cancer
- Plays a role in weight loss, because high-fiber foods make you feel fuller and they displace higher-calorie foods in the diet

**How much fiber do I need?**

For adults, needs vary by age and gender:

- Men, 50 yrs old and younger=38g/day
- Men, 51 yrs old and older+30g/day
- Women, 50 yrs old and younger=25g/day
- Women, 50 yrs old and older=21g/day

**Tips to Adding More Fiber to Your Diet**

1. Serve high-fiber vegetables such as:
   - Kale
   - Broccoli
   - Cauliflower
   - Spinach
   - Squash
   - Zucchini
   - Celery
   - Carrots
   - Onions

2. Use more dried beans such as:
   - Black beans
   - Black-eyed peas
   - Pinto beans
   - White beans
   - Lentils

3. Include higher-fiber fruits in your diet, such as:
   - Prunes
   - Apricots
   - Plums
   - Raisins
   - Cantaloupe
   - Blueberries
   - Apples (with skin)
   - Pears
How to Increase Volume in Your Meals

Salads Fill You Up

- Vegetable salads- any combination of vegetables will work. Try something new to add variety and prevent boredom
- Use low calorie dressing to avoid a calorie pitfall
- Add chicken, tuna fish or beans to make a complete meal
- Bean salads combine three or more different types of beans with vegetables, herbs and a vinegar based dressing.

Soups Satisfy Your Hunger

- Numerous research studies report that starting your meal with soup helps people eat less calories (total calories in the meal)
- Broth-based soups have shown to help people lose weight and keep it off
- Soup takes a long time to eat, fills up your stomach and takes time to empty, which keeps you satisfied longer

Legumes Are Versatile

- Add beans (black, kidney, chickpea, soybean) or lentils to soups, stews, chili, salads, pasta, rice, casseroles, pizza and pasta sauces
- Puree legumes and use as dips or for spreads on sandwich

Energy Dense Foods

- Foods with a lot of fat are very energy dense because fat contains the most calories gram per gram than the other nutrients
- Pre packed foods are very energy dense because of the added fats and sugars
- Foods with added fats and sugar provide lots of energy but come in very small packages.

High density foods include:
- Meat
- Cheese
- Pizza
- French fries
- Salad dressing
- Bread
- Ice cream
- cake

Very high density foods include:
- Crackers
- Chips
- Cookies
- Chocolate/Candies
- Nuts
- Butter
- Alcohol
Which do you think would keep you satisfied longer?

1 cup of fresh fruit  
¼ cup of trail mix

Lighten Up Your Snacks

- Medium-size apple = 72 calories
- Medium-size banana = 105 calories
- 1 cup steamed green beans = 44 calories
- 1 cup blueberries = 83 calories
- 1 cup grapes = 100 calories
- 2 Tbsp hummus = 46 calories, serve with:
  - 1 cup carrots = 45 calories
  - 1 cup broccoli = 30 calories
  - 1 cup bell peppers = 30 calories

Don’t overwhelm your food with added calories

- Eat fruits and vegetables the way nature provided or with fat-free or low-fat cooking techniques:
- Add herbs and spices
- Cook in reduced sodium vegetable broth
- Use homemade dressings
- Add oils last to add flavor but avoid overuse
- “Cut” your grains with cauliflower or spaghetti squash

Healthy Shopping on a Budget

Saving Money:

Create a budget

- knowing your overall budget will show how much is available for grocery budget
- shopping without a budget often leads to overspending

Plan a weekly menu

- use store ads to help plan out a weekly menu
- use simple recipes that use few ingredients
- keep track of pantry item inventory to avoid buying extra items

Use a grocery list

- build a grocery list for your weekly menu
- sticking to a grocery list minimizes impulse purchases
Saving money

- stores often have weekly ads that show what’s on sale
- buy in bulk when efficient
- use coupons
- join club memberships for perks and discounts
- explore different brands of the same product
- compare different stores and their prices

Don’t shop hungry

- hunger can prompt impulse buying for foods you do not need
- stick to the grocery list

Shop alone

- Shopping with kids can lead to additional purchases

Avoid extra trips

- one item trips can lead to additional purchases
- shopping at convenience stores generally have inflated prices

Shop the perimeter of the store

- ensures that most of your budget is spent on whole nutritious foods
- the outside perimeter of the store tends to have food in the least processed form

Buying Food:

Fruits and Vegetables

- Find out when your local store stocks produce
- fresher purchases ensures that they last longer with less waste

Buy frozen produce when cheaper

- Frozen fruits and vegetables are flash frozen at peak freshness
- There is no difference in nutrition between fresh and frozen produce

Meat

- Eating more vegetarian dishes can cut down on meat costs
- Larger cuts of meat that are less processed are generally cheaper
- Large cuts of meat can be used to make meals throughout the week

Dairy
• Buy the appropriate size of milk that will be used to minimize waste
• Yogurt can be a nutritious and inexpensive snack
• When shopping for cheese, look for low-fat or fat-free varieties

Junk food
• junk food leads to unnecessary costs
• provide little nutrition
• reliance on junk food can lead to costly medical issues in the future

Snacking
• Pre-made snacks are convenient and less expensive
• Trail mix, slice veggies, or whole fruit can make great snacks
• If possible, buy snacks in bulk, and separate into small bags to save
• Healthy snacking can help prevent overeating

Beverages
• Soft drinks and juices are costly and full of sugar
• Drinking water is a cheaper and healthier alternative

Make meals with convenience
• Crock pot cooking can save money and time
• Utilize leftovers to make additional meals throughout the week
• Keep ingredients available to make quick and easy meals like spaghetti, tacos and hamburgers
• Freeze leftovers or meals made in bulk to reheat later in the week.

Holiday Survival Tips
• Does the average American really gain 5-10 pounds (lb) over the holidays?
  • How does weight gain occur?
    ✓ 3500 food calories=1 lb of fat
    ✓ One slice of pumpkin has 545 cal, 23 g fat, 72 mg sodium, 53 mg cholesterol, 69 g carbs

• There is no such thing as a bad food!
  • How much and how often you eat higher-calorie, higher-fat foods is what is bad.
• **There are two ways to manage weight**
  - Portion control
  - Substitution

• **How important is it for you to manage your weight during the holidays?**
  - **Halloween**
    ✓ About 30% of children ages 2-19 are overweight or obese
    ✓ Approximately 30% of adults in the United States are either overweight or obese
    ✓ Help maintain a Healthy weight:
      - Offer treats such as stickers, pencils, Play-Doh, glow sticks, or miniature candy bars
      - Introduce the Switch Witch, who comes at night like the Tooth Fairy and replaces the child’s candy with toys
      - Have children sell back their candy (to their parents) for money or books
  - **Thanksgiving**
    ✓ Choose your turkey wisely
      - Dark Meat with Skin (206 cal)
      - Dark Meat without Skin (183 cal)
      - White Meat without Skin (120 cal)
  - **Christmas/Hanukkah/Kwanzaa**
    ✓ Watch out for sweets
  - **New Year**
    ✓ Watch for liquid calories
      - 12 fl oz beer, 150 cal
      - 6 fl oz wine, 124 cal
      - 8 fl oz apple cider, 120 cal
      - 1.5 fl oz alcohol, 110 cal
      - 12 fl oz lite beer, 100 cal
  - **Reunions and Parties**
    ✓ 2 tbsp icing=150 calories
      - Get a middle piece of the cake instead of a corner piece and save calories. Limit the icing you eat or pick the smallest piece.
  - **The 3 Ts that help you manage your weight during holidays:**
    ✓ Tips
    ✓ Tricks
    ✓ Techniques
• **Holiday Recipe Modification**
  - Alter recipes to reduce fat and calories
  - Substitute skim milk and low-fat sour cream for higher-fat products
  - Look at the calories and fat you can save by making small changes
  - Try switching from:
    - Evaporated milk (whole) to evaporated milk (skim)
    - Heavy cream to evaporated skim milk
    - Butter or margarine to fat-free butter spread
    - Regular cream cheese to lite or fat-free
    - Regular ground beef to 93% lean ground turkey or 92% lean
  - Try:
    - Reducing oil in recipes
    - Use applesauce or banana puree to assist with moistness
  - Cutting a mere 100 calories/day will allow you to lose (or not gain) 10 lb in 1 year
  - Plan:
    - Plan what you will take to parties
    - Pick your ingredients wisely
  - Use Substitutes
    - Bring your own salad dressing, diet soda, and low-fat or low-salt condiments
    - Reduce those calories by understanding how many calories and how much fat you can save

• **Advice you should always remember**
  - What does this mean to you?
    - Switching from 2 Tbsp regular ranch dressing to 2 Tbsp fat-free Italian dressing saves you 265 calories
    - Walking 1 hour at 4 mph, 8000 steps, burns 273 calories for a 150-lb person
    - Switching from regular soda to diet will save you about 150 calories/12-fl-oz can
    - Walking 30 minutes at 4 mph (4000 steps) burns 136 calories for a 150-lb person
  - No people Pleasing
    - Eat only what you desire
    - Do not eat as an obligation to others, even if they have cooked your favorite dish
✓ Make sure you make your own decisions—you are the one who will have to live with the consequences
✓ Stand up for yourself—others may actually respect you for it
✓ Be Assertive—turn down certain extra helpings of food without feeling guilty
✓ Use a napkin instead of a plate to put your food on

- Choose To Eat Healthy Ahead of Time
  ✓ Focus on fruits and vegetables
  ✓ Do not forget to eat breakfast
  ✓ Do not think: “I already blew it. I might as well blow it more.”

- DO NOT SKIP MEALS
- Visualize
  ✓ Visualize yourself eating healthy prior to attending the holiday meal
  ✓ Walt Disney once said, “If you can dream it, you can do it.”
- Stay Focused
  ✓ Know what you are doing
  ✓ Keep a journal
  ✓ Watch what you eat before or after the main meal
- Stop Eating
  ✓ Stop eating when you are physically full
  ✓ Start learning how to recognize the difference
  ✓ Take a time-out when you think things are getting out of control

- TRUTH
  ✓ Putting a couple of pounds on will not cause you to go back to square one
  ✓ You have already learned what is healthy
  ✓ No one can take that away from you

- After The Holidays
  ✓ Resume your lifestyle of balance and wellness just after the holiday has passed
  ✓ Change your thinking, if you need to
  ✓ Do not think, “I already blew it, so I might as well blow some more.”
APPENDIX F: BEHAVIOR CHANGE ACTIVITIES

Reward System Reprograming

Activity

Give each participant their personal reward jar.

Instruct each participant that today we will learn how to reprogram our reward system. Each participant will make a small list of things they would like to purchase or events they would like to attend, things they have wanted to do but have been expensive or not in their budget.

**Must be non-food items**

Instruct each participant that each time they want to buy junk food, fast food, food that is not going to help them achieve their goals, etc., they will put the same amount of money it would have cost them to buy that food into their reward jar instead of buying that particular food.

At the end of the month they can “cash in” the jar for the activity, clothes, etc. they had on their list.

This will serve as their “reward” for achieving their goals, instead of using food to reward themselves.

Examples of Rewards

- Massage
- Facial
- Spa day
- Shop for a new outfit
- Buy new shoes
- Take a dance class/pottery class
- Go to a show/play/musical
- Go on a girl’s trip
Setting Goals

Activity

When deciding to lose weight, setting realistic goals are an important first step. Goals should be specific, measureable, attainable, realistic, and timely. Planning out meals in advance is one way to ensure that they know exactly what they are eating and what is going into their food.

Participants should plan out all of their meals for the week in advance. They should make a list of those foods before grocery shopping and stick to the list. Trying new recipes that use a variety of fruits, vegetables, and whole grains are encouraged. Planning meals will discourage eating fast food visits as often. Making food at home is also cheaper than going out to eat.

Examples of Realistic Goals

- “I will lose 1-2 pounds per week for 12 weeks.”
- “I will exercise for 30 minutes a day five days a week.”
- “I will limit fast food by planning meals and snacks in advance.”
- “I will read labels and become more aware of the foods I purchase.”
Self-Monitoring

Activity

Participants will create an exercise calendar for the month and hang it on the refrigerator or somewhere in the house they will see. They should plan out which exercise they will do, what time they will begin to exercise, and the duration of the exercise. If they exercise every day they planned on the calendar for a month, they should reward themselves with a fun activity. Rewards include going to a movie, watching a band, buying an outfit, or taking a bath. A counselor or registered dietitian should give feedback on how participants are doing and offer encouragement.

Examples of Exercises

- Walking
- Riding bike
- Yoga
- Pilates
- Kickboxing
- Swimming
- Exercise DVDs
- Free weights
- Join an exercise class
- Aerobics

Tips for Success

Bring gym clothes to work if they plan on going to the gym right after work.

Plan the exercise at a time of day where they are least likely to be interrupted.

Find a friend or family member to exercise with.

Track exercises during the week.

Find an exercise that that enjoy.
Instruction Manual for SuperTracker

Consistency and awareness are important factors in leading a healthy lifestyle. SuperTracker is a great website that will allow you to track your food, physical activity, and goals.

How to Create a Profile

1. Type in https://www.supertracker.usda.gov/default.aspx into your search browser
2. It will lead you to SuperTracker homepage.
3. Click “Create Profile” in the upper right hand corner of the screen.
4. Complete Step 1: Personalize Your Profile
   a. Type in your profile name, age, gender, physical activity, height, weight
   b. This section will be used to calculate your nutrition needs (calories, protein, etc.).
   c. It will take into account your activity levels, so you will know how many calories you need with exercise.
   d. It is very important to use current information. This will help in creating accurate needs based on your unique lifestyle habits and body size.
5. Complete Step 2: Register to Save Your Profile
   a. Type in your username, password, re-enter password, password hint, security question, security question answer, email address, re-enter email address.
   b. Make sure to choose a username and password you will remember.
6. Complete Step 3: Submit to View Your Plan
   a. Hit the blue submit button at the bottom right screen
7. You will then be asked about your weight goal.
   a. Click “maintain your current weight” if you do not want to gain/lose weight.
   b. Click “move toward a healthier weight” if you do want to gain/lose weight.
   c. A note about BMI will also pop up.
      i. It will tell you if your weight is in the healthy range.
      ii. Your BMI is calculated using your height and weight.
8. Scroll down and hit the blue “submit” button again at the bottom of the screen.

How to Track Food

1. Type in https://www.supertracker.usda.gov/default.aspx into your search browser
2. Click “Log In” in the upper right hand corner of the screen.
3. Type in the username and password you created in the appropriate boxes.
4. Your homepage will load.
5. Click “Food Tracker.”
6. This page will show a number of your targets at the top of the screen.
   a. The Physical Activity Target will show how many minutes of physical activity you should participate in each week
   b. Your Daily Calorie Limit will show an allowance, eaten, and remaining.
      i. The allowance shows how many more calories you can eat
      ii. The eaten shows how many calories you had that day
      iii. The remaining shows how many calories you can eat to meet your needs.
      iv. Note: The calorie allowance takes into account your physical activity. DO NOT add to your allowance if you worked out.
   v. The Daily Food Group Target shows the food groups grains, vegetables, fruits, dairy and protein foods:
      1. Target shows how much of that food you should consume
      2. Eaten shows how many you ate today
      3. Status shows
7. To add food to your daily food diary type in the food you had eaten in the box that says “type in your food here.”
8. After you type in your entry, a number of results will show.
   a. HINT: Choose the choice that is most similar to what you ate.
9. Let’s say that you ate 3 cups of lettuce that was cooked with salt but no oil was added for lunch.
   a. Type in “lettuce”
   b. 89 results will appear.
10. Click “Lettuce, cooked (with salt, no fat added).
11. Then enter information under “Food Details.”
12. Choose an amount.
    a. Continuing with the example, click the box with the number. Click the number 3.
13. Choose a mealtime.
    a. Continuing with the example, click lunch.
14. Click add.
15. Once you add the meal, a number of statistics will appear.
    a. Under Meals
       i. The total calories for your food item will be added.
       ii. The calories consumed at that meal will be added.
    b. Under Daily Calorie Limit
       i. Your allowance, eaten, and remaining will be adjusted.
    c. Under Daily Food Group Targets
       i. The food will be added to its appropriate food group.
ii. For lettuce, the three 3 cups will be added under the “vegetables” column.

d. Under Daily Limits
   i. The total calories eaten will be added to your daily limit of calories, oils, saturated fat, and sodium.
   ii. In the example, the lettuce was 11 calories and was cooked in salt, no fat. The sodium (salt) was added, and the calories were added.

16. To add more food, you can begin the search again. Repeat steps 7-15.

17. The foods you add will be saved under the “My Favorite Foods List”
   a. This option will allow you to add foods that you have already eaten.
   b. For example, if you eat lettuce for lunch every day, you can simply find lettuce under My Favorite Foods List.
   c. This will allow you to quickly add foods to your food diary.

How to track Physical Activity

1. Type in https://www.supertracker.usda.gov/default.aspx into your search browser
2. Click “Log In” in the upper right hand corner of the screen.
3. Type in the username and password you created in the appropriate boxes.
4. Your homepage will load.
5. Click “Physical Activity Tracker.”
6. Let’s say you walked, at a rate of 30 minutes/mile for 20 minutes on Monday.
7. Type in “walk” into “type in your activity here”
8. Click “go.”
9. Click “walking, 2mph (30 min/mile).
10. Enter your duration of the activity. This is the time spent doing the activity.
    a. Type “20” in the minutes box.
11. Choose the day you participated in the activity.
    a. Click “Monday.”
12. Click “Add.”
13. Once you add the activity, a number of statistics will appear.
    a. Under “Activities for the week of…”
        i. It will show how many calories burned, duration, and MIE minutes of the activity you completed.
        ii. It will show you your physical activity for the week.
    b. Your weekly total will appear.
        i. The amount of MIE (Moderate Intensity Equivalent)
           1. These are the minutes of moderate intensity you spent working out. Moderate activity is shown to give many health benefits, including weight loss and maintenance.
14. To add more physical activity, you can begin the search again. Repeat steps 5-14.
15. The physical activity you add will be saved under the “My Favorite Activity List”
   a. This option will allow you to add activity that you have already eaten.
   b. This will allow you to quickly add activity to your physical activity diary.

How to Track Your Weight

1. Type in https://www.supertracker.usda.gov/default.aspx into your search browser
2. Click “Log In” in the upper right hand corner of the screen.
3. Type in the username and password you created in the appropriate boxes.
4. Your homepage will load.
5. Click “My Weight Manager.”
6. This will track your weight over time and show your progression.
7. Type in your weight in the weight box.
8. If your doctor or RD has suggested a goal weight,
   a. Click “goal weight”
   b. You can choose to maintain your current weight or move toward goal weight.
   c. Type in your goal weight in the goal weight box
   d. Click “add”
   e. A box will appear that will give a recommendation for the amount of calories you can consume per day.
   f. Click “okay.”
9. As time progresses, you can add your current weight in the Weight Manager
10. Your weight history will appear to the right of the screen.
   a. This graph will give you a visual representation of how your weight has been trending, since your first entry.
11. After you enter your weight for the day, click “My Journal”
   a. You will find this below the dark blue bar, at the top of the page. It is right below “Track Food & Activity”
12. You will then fill out the empty boxes: Title, foods eaten, meal location, physical activity and notes.
   a. Make sure you include as much detail as possible.
   b. In the notes section, use this area as a journal entry. Enter what occurred during your day, how you felt, etc.
13. Click “save” once you are done filling out the entry.
14. The next time you enter a weight (in the future),
   a. Go to the “My Weight Manager”
   b. Click the box that says “Show My Journal Entries”
   c. Red dots will appear above the dates that you entered a weight and journal entry.
d. If you click the red box, the journal entry you had written that day, will appear.
   i. This is a great tool to understand how your daily activities, feelings, and other lifestyle habits reflect your eating habits.
   ii. Understanding your habits and emotions and therefore, your food trigger, are extremely useful in successful weight loss, gain, or maintenance.
One third of college students are overweight & obese; gaining an average of 11 pounds during their undergraduate years. Emotional eating is eating food in response to emotion, most often negative, and is unrelated to hunger. Emotional eating is associated with weight gain. Recognizing emotional eating and identifying its triggers will allow you to prevent weight gain and better manage your eating habits.

**Recognizing Emotional Eating:**

To identify what triggers emotional eating, start a food diary and keep track of when you eat, what you eat, and the stressors, thoughts, and emotions you feel as you eat. The food diary will allow you to identify patterns that show the relationship between your emotions and food intake.

**Common Triggers:**

- Depression, boredom, loneliness, chronic anger, anxiety, frustration, stress, and low self esteem

**Developing Alternatives To Emotional Eating:**

When you start to reach for food in response to an eating trigger, try one of the following activities instead:

- Read a good book or magazine or listen to music.
- Go for a walk or jog.
- Take a bubble bath.
- Do deep breathing exercises.
- Play cards or a board game.
- Talk to a friend.
- Do housework, laundry, or yard work.
- Write a letter.
- Or do any other pleasurable or necessary activity until the urge to eat passes.

Stress Management

Activity

Many people tend to make unhealthy choices when faced with stress. Instead of continuing with these negative habits, we need to explore what effectively helps us manage stress. Many people turn to exercise, reading, or music to help relax them rather than food.

We will figure out which hobbies or activities can help us cope with stress. When you feel stressed, stop what you are doing and enjoy an alternate activity. Taking a brief break at work instead of grabbing food is also a positive way to handle stress.

Keep a journal of common stressors and how you will deal with them in the future. When you feel stressed and cope with it, write down how you handled the stressors and how well it worked for you. You can look back on your journal if you feel you can’t cope with a stressor to see how you successfully handled something in the past.

Ways to Manage Stress

- Read a book
- Listen to music
- Write
- Spend time with friends or family
- Exercise
- Meditation or yoga
- Get enough sleep
- Take a vacation or short trip
- Participate in a hobby
Cognitive Restructuring

Activity

Thinking positively can help with weight loss. Participants should find ways to remind themselves that they can reach their goals which can help motivate and encourage them to succeed. Writing down positive affirmations helps people reflect upon what has helped them succeed in the past.

Participants should write down positive thoughts about their body and past successes. They should place them somewhere that they will see a few times a day. Some places could be on the bathroom mirror, a refrigerator, or on the inside of the pantry. Seeing these positive thoughts throughout the day will help remind participants why they want to lose weight and that they can successfully reach their goals.

Examples of Written Positive Affirmations

- “I love how I feel after I finish a work out.”
- “I want to become a healthier individual.”
- “I am achieving my weight loss goals so far.”
- “I think about what I eat.”
- “I am determined to reach my weight loss goals.”
- “I want to take care of my body.”
Social Support

Activity

Finding encouraging support is important for people losing weight. Some people may end up hindering goals rather than supporting, so it is important for participants to find people who are going to fully support their weight loss goals, help them, and hold them accountable for their actions. Having a person to exercise with or someone to help cook healthy meals at home can make a huge difference in reaching their goals.

Social support can be found online, at work, or in their own homes. Participants should meet with their social support group or person, write down their goals and hold each other accountable. Reward each other with nonfood rewards if they are able to reach goals, such as losing 1-2 pounds in a week or exercising five days a week.

Examples of Social Support

- Online groups such as myfitnesspal, sparkpeople, and WOWY
- Coworkers
- Spouse
- Friends
- Relatives
- Roommates
- Counselor
Relapse Prevention

Activity

Participants should plan out strategies for situations that they feel they may relapse, such as a holiday, vacations, or celebration. Some examples of strategies would be planning morning walks on a vacation or keeping low fat and calorie condiments in the house. Participants will write out the strategies and discuss them with their social support person or group.

Relapses may occur, but it is important how participants handle it. Participants should turn to those who support them and they can help get them back on track. Participants should make a journal about the days that went well, and they can read about what they did on those days to make changes. Relapses can be prevented by controlling the environment.

Examples of Way to Control Your Environment

- Get rid of unhealthy foods in home
- Keep healthy snacks available
- Don’t eat while doing other things such as watching TV or talking on the phone
- Don’t grocery shop when you are hungry
- Fill plate with fruits and vegetables at a buffet first
- Use a smaller plate to help control portions
- Eat slowly at meals
- Drink plenty of water between meals
Recruitment Flyer

Department of Kinesiology and Nutrition Sciences
Weight Management and Health Related Behavior Research Study

Be part of an important Nutrition research study!

- Are you between 18 and 65 years of age?
- Do you want to change your eating and exercise habits in order to lose weight and gain health?

If you answered YES to these questions, you may be eligible to participate in a Nutrition study conducted by the UNLV Department of Kinesiology & Nutrition Sciences. This study isn't like any other! You won't be asked to go on a crazy diet or take any type of supplement. The purpose of the study is to teach you how you can change your eating and exercise habits in order to lose weight and gain health.

Components of the study include learning the principles of a healthy diet, health benefits of physical activity, portion control, healthy cooking methods, nutrient density, and social support. All classes are conducted by a Registered Dietitian/Nutritionist and Licensed Dietitian.

By the end of the study, we hope to have a better understanding of the effectiveness of a variety of educational techniques used in weight management and how to best implement these findings into an ongoing community outreach program.

If you are interested in participating, please contact Christina Vergara, at vergarac@unlv.nevada.edu or Dr. Laura Kruskall at laura.kruskall@unlv.edu. We can also be reached at 702-895-4328.
**Recruitment Script for the radio:**

Hello everyone, my name is Christina Vergara; I am a Registered Dietitian/Nutritionist and Licensed Dietitian. I am here because I will be conducting a weight management research study and I would like to invite you to participate. The study is being conducted by the UNLV Department of Kinesiology & Nutrition Sciences.

This study isn’t like any other! You won’t be asked to go on a crazy diet or take any type of supplement. The purpose of the study is to teach you how you can change your eating and exercise habits in order to lose weight and gain health.

Components of the study include learning the principles of a healthy diet, health benefits of physical activity, portion control, healthy cooking methods, nutrient density, and social support. All classes are conducted by me; a Registered Dietitian/Nutritionist and Licensed Dietitian.

By the end of the study I will hope to have a greater insight as to the effectiveness of a variety of educational techniques used in a weight management and how to best implement these findings into an ongoing community outreach program.

If you are interested in participating, please contact Christina Vergara, at vergarac@unlv.nevada.edu or Dr. Laura Kruskall at laura.kruskall@unlv.edu. We can also be reached by calling 702-895-4328.
TITLE OF STUDY: The Effects of a Comprehensive Weight Management Program, Including Nutrition Education, Physical Activity, & Behavior Change Techniques on Weight Loss and Health-Related Behaviors

INVESTIGATOR(S): Laura Kruskall, PhD, RDN, CSSD, LD, FACSM; Christina Vergara-Aleshire, RDN, LD

For questions or concerns about the study, you may contact Christina Vergara-Aleshire at 702-467-9030.

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted, contact the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-895-2794 or via email at IRB@unlv.edu.

Purpose of the Study
You are invited to participate in a research study. The purpose of this investigation will be to:

1. Measure the effectiveness of a variety of educational techniques used in a weight management program conducted on the University of Nevada, Las Vegas campus.
2. How to best implement these findings into an ongoing community outreach program.

Participants
You are being asked to participate in the study because you fit this criterion: Eligibility criterion for candidates will be based on three factors – (a) classification of overweight or obesity (calculated BMI greater than 24.9); (b) age of 18-65 years, and (c) previous attempt to lose weight. Individuals will be excluded if they are currently taking medications designed to aid in weight loss or are participating in a weight loss program, are pregnant, lactating, <6 months postpartum, or planned to become pregnant during the time of the investigation.

Procedures
If you volunteer to participate in this study, you will be asked to do the following:
1. Report to the Nutrition Sciences main office (BHS 319). You will then be escorted to the testing room.
2. Initial and post treatment body measurements will be taken (BHS 354) that include:
   a. Height & Weight
   b. Waist & Hip Circumference
   c. Triceps skinfold measurement
3. At this point, it will be determined whether or not you meet the inclusion criteria in order to participate in the study.
4. If you meet the inclusion criteria, you will be randomly assigned to one of two groups – Group A or Group B (See procedures number 6 & 7)
5. You will be asked to answer three questionnaires both at the beginning and at the end of the testing period. (AT HOME):
   a. General Nutrition Knowledge Questionnaire
   b. Health-Related Behavior Questionnaire
   c. Consumer Satisfaction Survey (Pre/Post)
6. **Group A:** You will be asked to attend eight, 60-minute weekly meetings consisting of nutrition education and behavior modification strategies offered at each session (BHS 212).
   a. Sessions are conducted in groups. All group members will be research subjects.
   b. See table below for topics presented at each session.
   c. You will be asked to perform in-classroom activities that will help to promote changes in behavior that may lead to better health.
7. **Group B:** You will receive weekly emails consisting of nutrition and physical activity education, and behavior modification strategies.
   a. You will be asked to read the information provided.
   b. See table below for topics.

<table>
<thead>
<tr>
<th>Session</th>
<th>Education</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Principles of Weight Management &amp; Nutrients</td>
<td>Retrain your brain – healthy ways to reward yourself</td>
</tr>
<tr>
<td>2</td>
<td>Health Benefits of Physical Activity</td>
<td>Set achievable goals</td>
</tr>
<tr>
<td>3</td>
<td>Record Keeping &amp; Portion Control</td>
<td>Track your diet &amp; physical activity</td>
</tr>
<tr>
<td>4</td>
<td>Common Nutrition Myths</td>
<td>Recognize what events/situations lead you to overeat</td>
</tr>
<tr>
<td>5</td>
<td>Fad Diets</td>
<td>Discover methods to cope with stress</td>
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<tr>
<td>6</td>
<td>Nutrient Density &amp; Functional Foods</td>
<td>Believe in your ability to succeed</td>
</tr>
<tr>
<td>7</td>
<td>Shopping on a Budget</td>
<td>Connect with people that share your goals</td>
</tr>
<tr>
<td>8</td>
<td>Surviving the Holidays</td>
<td>Develop strategies that will prevent you from returning to your old habits</td>
</tr>
</tbody>
</table>

**Benefits of Participation**
There may be direct benefits to you as a participant in this study. Benefits may include weight loss, learning the principles of a healthy diet, health benefits of physical activity, portion control, healthy cooking methods, and social support. Benefits to society are to have a program that instructs the community about the health benefits of good nutrition and physical activity as well as the skills necessary to implement changes and strategies for behavior change that is customized for the community being served.

**Risks of Participation**
There are risks involved in all research studies. This study may include only minimal risks. You may become uncomfortable when answering questions about your food intake. You may become uncomfortable when body measurements are taken.

**Cost /Compensation**
There will not be financial cost to you to participate in this study. The study will take sixty minutes (either in the classroom or at home), one time per week, for eight weeks of your time. You will not be compensated for your time.

**Confidentiality**
All information gathered in this study will be kept as confidential as possible. No reference will be made in written publications or oral scientific presentations that could link you to this study. All records will be stored in a locked facility at UNLV for 3 years after completion of the study. After the storage time the information gathered will be destroyed. All questionnaires and related documentation will be assigned a code number to protect your identity. No person other than the Investigators will have access to the code information. In addition, the person conducting your
classes is a Registered Dietitian/Nutritionist and Licensed Dietitian. If you are assigned to group A which meets as a group, your identity will be known to other group members.

**Contact Information**

If you have any questions or concerns about the study, you may contact Christina Vergara-Aleshire at vergarac@unlv.nevada.edu and/or Dr. Laura Kruskall at laura.kruskall@unlv.edu. Either investigator can be reached by calling the Nutrition Sciences main office at 702-895-4328. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact the UNLV Office of Research Integrity – Human Subjects at 702-895-2794 or toll free at 877-895-2794 or via email at IRB@unlv.edu

**Voluntary Participation**

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with UNLV. You are encouraged to ask questions about this study at the beginning or any time during the research study.

**Participant Consent:**

I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I am at least 18 years of age. A copy of this form has been given to me.

__________________________________________________________  ______________
Signature of Participant              Date

__________________________________________________________
Participant Name (Please Print)
REFERENCES


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