AN ABSTRACT OF THE THESIS OF

Julie A. Jensen for the degree of Master of Science in Nutrition and Food Management presented on June 14, 2007.

Title: Weight Stability and Influences upon Eating and Exercise Behaviors Among College Students

Abstract approved: ________________________________________________________________

Mary M. Cluskey

Students are entering college heavier than ever before and some are gaining weight faster than the general population. Weight studies have been conducted, but are limited in scope about how behavior related choices are made. This study was an effort to determine weight stability and to explore the influences of eating and physical activity habits, among undergraduate students attending Oregon State University (OSU) during the 2004-2005 school year.

The study methodology included: Phase One, involving anthropometric and demographic data collection on students enrolled in a class entitled “Lifetime Fitness” (HHS 241) during fall quarter 2004 and Phase Two, exploring influences upon behavior via focus groups from a subset of Phase One participants. Phase One revealed that students gained weight (M=2.62 pounds, SD = 5.42 pounds) during the first eight weeks of fall term. Seventy percent of students had a normal weight BMI classification at the start of the term. By the tenth week, the percentage had dropped to 68% and the incidence of obesity and overweight rose from 25% to 28%.
The Phase 2 focus groups discussions revealed that most college students could describe a healthy lifestyle, but may fail to practice such. Lack of time and money, as well as other priorities were all sighted as reasons for not practicing healthy behaviors. Those that were most successful in practicing healthy eating and exercise habits believed that success in one habit led to success in the other. Intrinsic motivation was most likely to lead to healthy behaviors. The strongest influences on food choice were time, money, and the perception of availability and quality of food. The most frequently discussed motivator for exercise was enjoyment. Discussion about eating healthfully seemed to reflect their perception that it was more challenging than being physically active. Friends and roommates were both positive and negative influences, and constitute the primary support system for college behavior choices. Life skills and discipline are needed to practice healthy lifestyle behaviors and only a few participants appeared to be equipped with these. Most participants made statements that suggest a lack the rational decision making skills and maturity needed to consistently adhere to a healthy lifestyle. Some participants struggled with devising strategies to manage their eating and exercise behaviors.

This preliminary study revealed some outcomes that need further exploration. Students need a clearer and more accurate understanding of what makes a food healthy. Strategies to encourage intrinsic motivators for eating and exercise, providing peer reinforcement for exercise and finding strategies to build exercise into the busy schedule of a college student are areas needing further exploration.
Weight Stability and Influences Upon Eating and Exercise Behaviors
Among College Students

by
Julie A. Jensen

A THESIS
submitted to
Oregon State University

in partial fulfillment of
the requirements for the
degree of
Master of Science

Presented June 14, 2007
Commencement June 2008
Master of Science thesis of Julie A. Jensen presented on June 14, 2007

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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

___________________________________________________ __________________
Julie A. Jensen, Author
ACKNOWLEDGMENTS

I would like to thank my major professor, Dr. Mary M. Cluskey. Her help and guidance were pivotal to making this thesis a reality.

I would like to thank Dr. Deana Grobe for being there from the start and guiding me along the way.

I would like to thank Dr. James Ridlington for being part of my committee and for always having an encouraging word and a smile to share when I needed one.

I would like to thank Dr. Liz Gray for stepping in at the last minute to be my Graduate Representative.

I would like to thank Dr. Lori McGraw for being an excellent focus group moderator.

Lastly, I would like to thank my husband, Dr. Dean Jensen, for being my support system no matter what. I would also like to thank my children, Christopher and Kathleen Jensen, for all they sacrificed so that mom could work on her thesis.
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INTRODUCTION

One thing that is constant in life is that life changes. Behaviors change over the course of one person’s life and the environment changes from one generation to the next. The study of eating habits and physical activity behaviors of persons living in the United States of America (US) shows how great of an impact such changes can have on a person’s quality of life.

According to US government statistics, eating behaviors have deteriorated dramatically during the second half of the 20th century (Putnam, Allshouse and Kantor, 2002). We consume more kilocalories, while choosing fewer foods that meet health needs. During the same time period, people in the US have become so sedentary that physical inactivity is now considered a public health problem (Ainsworth, 2005).

The combination of unhealthy eating behaviors and physical inactivity contributes to overweight and obesity; which in turn, contributes to many preventable causes of death (Healthy People 2010, 2000). Epidemiological studies have shown that regular physical activity protects individuals from developing health problems that turn into chronic disabilities or premature death (Ainsworth, 2005).

There is evidence that adult eating and physical activity behaviors are most likely established during the final years of adolescence (Lin, Guthrie, and Frazão, 1999;
Neumark-Sztainer, Story, Ackard, Moe and Perry, 2000; Young and Fors, 2001; Zabinkski et al., 2006). Several researchers have concluded that a critical age for long term, adult behavior development is the college-bound 18-to-20-year-old, who is leaving home for the first time (Anderson, Shapiro and Lundgren, 2003; Conklin, Lambert and Cranage, 2005; Levitsky, Halbmaier, and Mrdjenovic, 2004; Sax, 1997). They report that weight gained during the freshmen year appears to be greater than that found in the general population (Levitsky et al., 2004); and that eating and physical activity behaviors established as a freshmen often deteriorate throughout the college years (Diskell, Kim and Goebel, 2005; Huang et al, 2003; Sax, 1997). While many researchers have studied their habits, no clear explanations have been provided to explain college students’ eating and exercise behaviors.

Hypothetically, this solution appears to be simple. If young people ate better and increased their physical activity level, problems with overweight and obesity might be avoided. In reality, it is not that simple. Teenagers and young adults do not change their behavior just because they are told to do so (Cason and Weinrich, 2002; Farrell, 2002; Hertzler and Frary, 1989; Horacek and Betts, 1998; Keating, Guan, Piñero, and Bridges, 2005; Skinner, 1991).

Since adult habits could be influenced by habits established during college, an important question to answer is: “How does coming to college impact eating and physical activity habits of new college students?”
Background

Adolescence has been defined as the bridge between childhood and adulthood (Mitchell, 2003). This stage of life, between the ages of 10-and-20-years-old, is marked by rapid physical, psychological and social development. No other decade will bring on more changes at a faster pace. By the time teenagers reach the age of 18-years-old, most major physiologic changes are complete and their development is marked by an increase in independence (Mitchell, 2003).

This increase in independence allows many 18-to-20-year olds to engage in poor eating habits. Excess consumption of fat, sugar and protein, avoiding fruits and vegetables, substituting soda pop for milk, and choosing fast and cheap options without consideration of nutritional content, have been identified as common behaviors among teenagers (Cason and Wenrich, 2002; Cross, Babicz, and Cushman., 1994; Dinger, 1999; Haberman, and Luffey, 1998; Huang, Song, Schemmel, and Hoerr., 1994; Lowry et al., 2000; Lytle, Seifert, Greenstein, and McGovern, 2000; Mitchell, 2003; Neumark-Sztainer, Story, Hannan, and Croll, 2002; Neumark-Sztainer, Story, Perry, and Casey, 1999; Nielsen, Siega-Riz and Popkin 2002; St-Onge, Keller and Heymsfield., 2003; Zizza, Siega-Riz and Popkin 2001).

In addition to poor diet, inactivity has been identified as a factor contributing to the growing problems of overweight and obesity in the US (Haberman and Luffey, 1998; Jabns, Siega-Riz, and Popkin , 2001; Lowry et al., 2000). At the end of the 20th century, approximately two-thirds of high school students met the US government’s recommendations for physical activity, by engaging in at least 30 minutes of physical
activity on most days (Healthy People 2010, Huang et al, 2003, Thompson and Veneman, 2005). There is evidence that this fraction drops to as low as one-third among college students and one-sixth of the general adult population (Diskell et al., 2005; Haberman and Luffey, 1998; Huang et al, 2003; Lowry et al, 2000).

Studies looking at weight gain among college students, indicate that as many as 70% gain at least five pounds during their first year of college (Anderson et al., 2003; Graham and Jones, 2002; Hodge, Jackson, and Sullivan, 1993; Levitsky et al., 2004). There is evidence that this is a faster rate of weight gain than found in the general population and that it is harmful when continued into adulthood (Levitsky et al., 2004; St-Onge et al., 2003). Students appear to be entering college heavier than ever before, because they are making many unhealthy lifestyle choices (Lowry et al., 2000). Researchers have not been able to explain why this happens or effective methods to change the behavior of this age group.

Research Objective

The purpose of this study was to measure weight stability among younger undergraduate students attending Oregon State University (OSU), to explore their eating and physical activity habits, and to look at influences that may impact these habits. Quantitative data was gathered to measure any body mass index (BMI) and weight changes that occurred during the first quarter of the school year. In addition, demographic and prior living circumstances data were gathered. Qualitative focus groups
solicited input from a subset of this sample, to determine which factors influence eating and exercise patterns during the initial college years.

Research Questions

1: What is the weight stability of college students during their initial college years?

2: How does college life influence food choices and consumption patterns?

3: How does college life influence physical activity and exercise patterns?

4: Do “pre-college” behaviors and influences have an impact on eating and exercise behaviors in college?

The research method chosen to address these questions consisted of two phases. Phase One was conducted during fall quarter of 2004. During the second week of fall quarter 2004, a questionnaire was distributed to all willing participants enrolled in a lifetime fitness class. Upon completion of the questionnaire, the students were weighed and measured. In order to identify weight stability, the students were weighed again at the end of the quarter (week ten).

Phase Two involved selecting a subset of the students who participated in Phase One to be subjects in focus groups that explored eating and physical activity habits, as well as any changes that entering college has had on the habits they grew up with. This data was analyzed in an attempt to identify any themes that might provide answers to the above mentioned research questions.
Definition of a Healthy Lifestyle

It is important to define “healthy” in the context of this paper, because people have different perceptions on what it means to be healthy. This study will use the definitions found in *The Dietary Guidelines for Americans, 2005* for healthy eating and physical activity (Thompson and Veneman, 2005). This publication, a joint effort between the United States Department of Health and Human Services (HHS) and the United States Department of Agriculture (USDA), provides science-based advice that is reviewed and updated every five years.

*Healthy Eating:* A healthy eating plan includes a variety of nutrient-packed foods every day. Focus on fruits, vegetables, whole grains, and reduced-fat dairy products and also include some lean meats, poultry, fish, beans, eggs and nuts. Avoid saturated and trans-fats, cholesterol, sodium and added sugars. All this should be done while staying within your daily energy needs for kilocalories (Thompson and Veneman, 2005).

*Physical Activity:* Be physically active for at least 30 minutes most days of the week (Thompson and Veneman, 2005). If weight gain is a problem, increase physical activity to a minimum of 60 minutes every day. Specific types of physical activity were not identified.

This study was funded through Oregon State University’s College of Health and Human Sciences small grant program and through a donation by the Oregon State University Dining Services.
Eating Behavior and Weight Stability

The purpose of this research was to determine weight stability and to explore the factors influencing eating and physical activity habits among undergraduate students attending Oregon State University (OSU) during the 2004-2005 academic school year.

When a teenager leaves home to start college, it may be the first time that this person has complete control of his or her environment. The literature shows evidence that the later years of adolescence (18-to-20-years old) is a critical period for habit formation (Anderson et al., 2003; Graham and Jones, 2002; Hodge et al., 1993; Levitsky et al., 2004; Lowry et al., 2000). The habits formed during these years may become the habits practiced during adult life.

One study, looking at the transition from high school to college, indicated that this could be a critical period of weight gain (Anderson et al., 2003). At the start of fall term (September), researchers measured weights and heights of college freshmen under the age of 20. This procedure was repeated at the end of fall term (December). Of the 135 college freshmen (58 men and 77 women) who provided complete information at both data points, one-fifth of these subjects were overweight in September. By December, this ratio had increased to one-third. The results indicated that 70% remained weight stable (within five pounds), 4% lost more than five pounds and one-fourth (26%) gained weight. Of the freshmen who gained weight, 14% gained enough to be reclassified from normal to overweight or obese.
A second study looked at the causes of weight gain during the first term of college (Levitsky et al., 2004). Researchers recruited 60 freshman enrolled in an Introduction to Nutrition class at Cornell University. Students were weighed and then completed a questionnaire at the start of a new term. During the twelfth week of class, the same procedure was repeated. The first questionnaire, which asked about their high school habits, was used as an internal validity check. A follow-up questionnaire, administered at the end of the term, asked about their habits during their first term at Cornell. Using the eating habit data collected from the follow-up questionnaire with initial weight as a covariate, the research team was able explain 71% of weight gain through multiple regression analysis. The important regression factors were: junk food consumption, weekend eating patterns, recent attempts at weight loss (dieting), dining out, late night snacking, hours of sleep and initial body weight. Most students gained a modest amount of weight (~ five pounds), but stayed within a healthy BMI range (20 – 23 kg/m²). Of those who participated, 51 were women and 9 were men. This is one of the few studies found that attempts to explain college student eating habits. It is limited by the fact that it is very small and that most participants were women.

The “Freshmen 15” is the speculation that freshmen are doomed to gain 15 pounds during their first year of college. One group of researchers studied how concern over gaining the “Freshmen 15” impacted freshmen weight gain (Graham and Jones, 2002). They distributed assessments about eating attitudes, body image, demographics, exercise habits and concern over gaining the “Freshman 15” to freshmen at a small, Midwestern college. Initial weight and body fat data were collected via the university’s
health service department. Forty-nine participants came back for follow-up weight measurements at the end of the year. Although some students did gain 15 pounds, the average weight gain was five pounds among the 59% that gained weight. Most of the participants were female (80%) and all lived on campus.

Another “Freshmen 15” study looked at several characteristics that might be associated with weight gain during this transition period into college life (Hodge et al., 1993). During their first term, 110 freshmen women volunteered to have their weight, height and frame size measured and recorded for extra credit in a Psychology class. Six months later, 61 returned for a follow-up set of measurements. Half of the participants (52%) maintained weight. One-third (30%) gained at least four pounds. Of the women who gained weight, the mean change was seven pounds. Almost one-fifth (18%) lost weight; the mean loss was five pounds. These authors were unable to identify characteristics that would explain why some women gained, while others lost weight. They found that most of the women studied did not gain weight and those that did, gained substantially less than the predicted 15 pounds. A possible limitation of this study is that those who did not return were embarrassed by their weight gain, thus decreasing the ability to show larger numbers with weight gain in the study.

These studies suggest that, in general, half of the students gain no more than five pounds during their first year of college, another 20% - 30% gain the infamous “Freshmen 15” and 20% -30% lose approximately five pounds. The results do not reveal consistent explanations about behaviors influencing weight stability during their first year of college, nor do they look at any differences between the genders.
Small lifestyle changes can have a large impact when they are practiced over a long period of time (Levitsky et al., 2004; St-Onge et al., 2003). Behaviors that lead to weight gain (as little as five pounds per year) while in college, will have a larger impact on the health of these students, as they age and their energy needs start to decrease.

Influence of Nutritional Knowledge

The prevalence and impact of nutritional knowledge upon behavior among college students is subject to researcher debate. Studies concerning the eating behaviors of college students often conclude that students need more education concerning the benefits of healthy lifestyle choices (Conklin et al., 2005; Lowry et al., 2000; Matvienko, Lewis and Schafer, 2001; Skinner, 1991). Others studies suggest that information alone does not encourage students to change their behaviors (Cason and Wenrich, 2002; Farrell, 2002; Herzler and Frary, 1989; Horacek and Betts, 1998).

After studying data collected on 4,609 undergraduates who completed the National College Health Risk Behavior Survey in 1995, researchers observed a high prevalence of overweight students (Lowry et al., 2000). Using self reported weights and heights, 35% of participants were identified as overweight or obese. The authors found that many college students make unhealthy lifestyle choices and recommended that colleges implement programs to increase student awareness concerning healthy eating habits and physical activity. The authors did not offer any explanations about why students make behavior changes.
One position paper suggested that providing nutrition information at the point-of-selection might help students maintain/achieve a healthy body weight (Conklin et al., 2005). A nutritionist and Dining Services Director at Concordia College in Moorhead, MN is concerned that providing such information in residence halls may promote eating disorders. She has observed that students who need the nutritional information ignore it and those who pay attention, care too much (Farrell, 2002).

Further evidence indicated that students often ignore the information presented to them (Cason and Wenrich, 2002; Horacek and Betts, 1998). Focus group discussions conducted at Clemson University’s Department of Food Service and Human Nutrition revealed that many college students are informed about nutrition, but choose to ignore what they know (Cason and Wenrich, 2002). A survey of 325 undergraduates at the University of Nebraska concluded that not all students choose food because it is identified as healthy (Horacek and Betts, 1998). While one-fourth (26%) of those completing the survey were consciously making healthy food choices, nearly half (48%) admitted that they went out of their way to avoid foods promoted as “healthy” or “nutritious”. These students were interested in taste, convenience, social appeal or cost. The recommendation made to food service directors was: do what you can to make options more healthful, but use other factors to promote it – avoid referring to items as “nutritious” whenever possible.

Several studies have looked at the impact of participating in an undergraduate college course concerning basic nutrition and its impact on healthy lifestyles (Herzler and Frary, 1989; Matvienko et al., 2001; Skinner, 1991). A survey of 212 students enrolled in
a nutrition course at Virginia Polytechnic Institute and State University, found that education alone did not change behavior (Herzler and Frary, 1989). This course did not change students’ eating habits and no explanations were found regarding college students’ eating behaviors. Another study of 286 women and 58 men enrolled in a basic nutrition course at the University of Texas showed that education can have a positive impact on behavior (Skinner, 1991). However, education only made an impact when the information was personalized to match the students’ current needs.

One intervention study of 40 college women examined what could be done to prevent weight gain among freshmen women (Matvienko et al., 2001). Of the 40 participants, 19 served as a control group and 21 enrolled in a nutrition science college course that emphasized human physiology and energy metabolism as a treatment group. All participants were weighed and given the same knowledge test at baseline, four months later (end of intervention) and 16 months later (one year following the intervention). While 70% of both groups remained weight-stable, the researchers saw promising results among large women (those with a BMI greater than 24 at the start of the study). One-year later, a follow up survey concluded that the large women who participated in the intervention retained the knowledge they had learned from the course and maintained a lower BMI than large women in the control group did. This study provided evidence that education was most effective when it is targeted to an audience; limitations include its size and the exclusion of men.
Although knowledge is an essential part of establishing healthy eating behaviors, knowledge alone is not effective at changing such behaviors. Research indicates that college students need to be given motivation that they can identify with before they will change their behavior.

Factors Influencing Eating Behaviors

Dormitories, especially ones with all-you-can-eat (AYCE) dining facilities, are often blamed for college students’ poor eating habits. Perhaps this is due to their restaurant-like atmosphere. Food eaten in restaurants may contribute to the decline of good eating habits, because the choices of food eaten away from home tend to be larger in portion and lower in nutrient density (Lin et al., 1999). Four studies that analyzed eating patterns have shown evidence that dining facilities are not causing the problems that students think they are (deCastro, 2004; Levitsky et al., 2004; Lin et al., 1999; McCrory et al., 1999). Not all of these studies looked exclusively at college students’ habits; they were all included because the same three indicators consistently predicted weight gain, regardless of age, status or how the data was collected.

The first researcher collected week long diet diaries on 867 free-living adults; 119 of these diaries belonged to undergraduate college students satisfying a course requirement (deCastro, 2004). The second group used the USDA’s 1994-96 Continuing Survey of Food Intakes by Individuals (CSFII) data, to analyze 1-day individual intakes on 4,780 children between the age of 2 and 19 (Lin et al., 1999). A third research group assessed food frequency questionnaires from 73 (58 women and 15 men) free-living
individuals between the ages of 19 and 80 (McCrory et al., 1999). The fourth research group collected surveys from 60 college freshmen upon the conclusion of their first semester at Cornell University (Levitsky et al., 2004). The indicators that predicted weight gain in all four studies were (a) frequent restaurant patronage, (b) consumption of high fat foods, and (c) late-night snacking.

Some of the freshmen participating in the study by Levitsky et al. (2004) lived in dormitories with AYCE dining facilities. Although these students ate large meals, they did not report frequent late-night snacking. Their diets were not higher in fatty foods nor did they gain any more weight than other participants in the study.

Studies concerning the impact of college students’ living environments have drawn conflicting conclusions. According to the definition of a healthy lifestyle, a healthy eating plan includes a variety of nutrient-packed foods every day (Thompson and Veneman, 2005). Haberman and Luffey (1998) reported that students who live on campus are more likely to eat the same food every day. Due to this lack of variety, micronutrient needs are often not met. Cason and Wenrich (2002) reported that off-campus students believe they eat better, because they can cook for themselves. Jakanowski (1999) reported that many young consumers do not know how to cook. Brown, Dresen and Egget (2005) reported that students on dormitory board meal plans were more likely to eat the recommended amounts of fruits and vegetables, while off-campus students were more likely to meet recommendations for grains. The biggest deterrents to healthy eating for students living off-campus were: lack of funds, refrigerator space and not knowing how to prepare foods.
There is evidence that the type of housing a student lives in does not have a large impact on eating behaviors. After distributing a questionnaire to 114 freshmen and sophomores (younger students) and 147 juniors and seniors (older students), researchers found the frequency and type of snacks and dining consumed by younger and older students to be very similar, despite differences in housing (Driskell et al., 2005). Almost 80% of students living in the dormitories were freshmen and female.

Dinger’s (1999) study included 576 co-eds living on-campus and 167 living in a fraternity or sorority and found that fruit, juice and vegetable consumption did not differ by gender, age, residence, housing, nor nutrition information received. While housing does not appear to impact eating behaviors, gender may play a role. The literature suggests that men may consume more high fat foods than women (Dinger, 1999; Johnson, Nichols, Sallis, Calafas and Hovell, 1998).

Some studies have asked participants to discuss what influences their eating behaviors (Cason and Wenrich, 2002; Horacek and Betts, 1998). A college students’ focus group study identified three barriers to healthy eating: time constraints, influence of friends, and campus food options (Cason and Wenrich, 2002). Students complained that the food was too high in fat and that the vegetables offered were unappealing. When making food choices, survey participants were most influenced by hunger cues, taste, time, convenience, value, and money (Horacek and Betts, 1998).

Studies on eating behaviors have looked at the relationship between time of day and weight stability (Bowman, 2006; de Castro, 2004; Hertzler and Frary, 1989; Huang et al., 1994). After analyzing 7-day diet diaries collected on 867 individuals, de Castro
(2004) found a correlation between the time of day that food was eaten and total food intake. In this study, late night snacking correlated with a greater overall food intake; eating a substantial breakfast correlated with a smaller overall food intake. Skipping breakfast was linked to being overweight by USDA nutritionist Shanthy Bowman (Bowman, 2006). Studies looking at consumption patterns found breakfast to be the meal most frequently skipped by college students (Hertzler and Frary, 1989; Huang et al., 1994).

Physical Activity Behaviors of College Students

Physically active students appear to have better eating habits than their inactive peers (Bebetsos, Chroni and Thoedorakis, 2002; Johnson et al., 1998). Researchers compared smoking, drinking, food habits and unsafe sex to physical activity (Johnson et al., 1998). The only factors that had a strong relationship were physical activity and food habits; those students who were most physically active also had the healthiest diets. Greek researchers found that students who participated in 45 minutes of physical activity at least three times per week also had healthy eating habits (Bebetsos et al., 2002).

Other literature suggests that college is a time when physical activity levels may decline (Driskell et al., 2005; Huang et al., 2003; Lowry et al, 2000; Sax, 1997). One survey study reported that 38% of college students participated in vigorous physical activity (Lowry et al., 2000). When compared to other demographic groups, these authors found the percentage of college students participating in vigorous activity lower than high school students (64%) and higher than the general population (15%). In
another study, nearly half (46%) of freshmen and sophomores (younger students) reported walking at least 31 minutes/day (Driskell et al., 2005). Among juniors and seniors (older students), the percent of those walking 31 minutes/day decreased to less than one-third (29%).

As part of a larger study, 736 college students completed a short survey on diet and physical activity (Huang et al., 2003). These researchers found that students under 20 years old were most likely to exercise and least likely to be overweight/obese. Only one-third of the students questioned were active for at least 30 minutes on most days. The authors expressed concern that college may be the last opportunity for educators to provide cost-effective health education and prevention interventions. Another survey study of 302 college students found that only 39% were active for at least 30 minutes on most days (Haberman and Luffey, 1998).

The Cooperative Institutional Research Program (CIRP) has been collecting data on the physical health of incoming college freshmen since 1987 (Sax, 1997). Half of the freshmen surveyed participated in some sort of physical exercise or sports for at least six hours every week throughout the 9 year period studied. A follow-up study of graduating college seniors indicated that most students’ physical activity level decreased as they aged. The majority of participants in this study (62%) were male.

Physical activity is difficult to quantify. Different activities have different intensity levels. Walking your dog through the park does not expend as much energy as a heated intramural soccer match. Some activities are aerobic, while others build or stretch muscles. All types of exercise are important. This is complicated further by the fact that
some people have physically active occupations. Researchers do not typically include occupational activity in their studies.

These issues make studies difficult to compare. Researchers have attempted to find ways of “standardizing” physical activity. One such attempt used the third National Health and Nutrition Examination Surveys (NHANES III) data collected on 4,964 young adults (between the ages of 18 and 30) to create a moderate and vigorous physical activity (MVPA) score (Dowda, Ainsworth, Addy, Saunders, and Ringer, 2003). Unmarried nonsmoking young adults, who attended school, were in good health, and interested in losing weight had the highest MVPA scores. Years of education and social support were also positively associated with MVPA scores. A limitation to this study is that it only included walking and leisure physical activities. Young adults with physically active jobs could have undervalued MVPA scores.

These studies suggest that as many as two-thirds of all college students are not physically active for at least 30 minutes every day and that physical activity decreases as they age. It is not clear why college students are so inactive.

Influence of Knowledge on Physical Activity Behaviors

There is evidence that knowledge influences the type of physical activity an individual chooses to engage in. One survey of 743 college students, looked at the differences in physical activity between the students living on-campus (residence halls) and those living in Greek houses (sorority or fraternity) (Dinger, 1999). Among participants, 576 lived on-campus and 167 lived in a Greek house. Wellness centers,
conveniently located on campus, provided information about healthy lifestyle behaviors, as well as exercise equipment, to residence hall students with a membership to the center. The students who received information from a wellness center included more stretching, muscular strength and endurance exercises in their physical activity routines than the other participants in this study. All data was self-reported.

As with eating behavior, the best outcomes are achieved when students are personally motivated to engage in an activity. Researchers studying 695 Belgium college students found that participants tried the hardest and were most successful when they were shown that the new skill would be personally beneficial, both now and in the future (Simmons, Dewitte, and Lens, 2003). Participants were divided into three different groups and taught to dribble a basketball. The first group was told that they needed to practice this skill to pass the class. The second group was told that practicing this skill will be useful in their future job and in daily life. The third group was told that this skill would not be directly useful for their educational training, but would benefit them personally in the future. The second group outperformed both the first and third groups by a wide margin.

Other Factors Influencing Physical Activity Behaviors

When it comes to physical activity, youth, good street lighting, trust in the neighborhood, and using private recreation areas are factors associated with higher levels of physical activity (Addy et al., 2004). Students who chose to live in off-campus housing (apartments) may have concerns about the safety of exercising in their own
neighborhood. Convenience and accessibility may help explain why exercise declines throughout the college years.

A study looking at the distance that students reside from university facilities, how much exercise equipment they own and their exercise frequency concluded that freshmen and sophomores use university recreation facilities more than juniors and seniors (Reed and Phillips, 2005). Most freshmen and sophomores live on campus, making university facilities economical and convenient to access. Juniors and seniors often choose to live off-campus, making access to university facilities more difficult. Although activity declined as the students got older and moved off-campus, students with exercise equipment in their homes exercised more often than those who did not.

Not only can housing impact how often students are physically active, it can also impact the type of activity they engage in. In a study of Greek houses vs. residence halls, the Greek residents were found to engage in more vigorous physical activity, usually in the form of intramural sports (Dinger, 1999). Students residing in the residence halls had more moderate physical activity, usually in the form of exercise at one of the university’s wellness centers’ gyms. One-third (32%) of the subjects who lived in a residence hall belonged to a university sponsored wellness center.

Gender may also have an impact on the type of physical activity students participate in. In a survey of 743 college students, stratified by sex to maintain a similar proportion of men vs. women, men were most likely to engage in vigorous physical activity (Dinger, 1999).
In an attempt to measure perceived benefits and barriers to physical activity, Brown (2005) used the Exercise Benefits/Barriers Scale to evaluate 398 college students’ motivations for being active. Three factors: pleasure, task improvement and physical performance were significantly associated with the benefits of exercise. Nothing was found to explain barriers. Of the 398 participants, 57% were female, 93% were white, 70% were freshmen and 80% met the national recommendations for physical activity, as published by the American Medical Association in 1995. One explanation for their ability to identify benefits, but not barriers in this study was that the research team sampled students coming to work out at the recreational center. These students have likely found ways to overcome potential barriers. This could also explain why such a high number were freshmen. As other studies have pointed out, freshmen tend to live closest to recreation facilities and be most active (Addy et al., 2004; Driskell et al., 2005; Huang et al., 2003; Reed and Phillips, 2005; Sax, 1997).

When looking at what motivates college students to be physically active, the literature strongly suggests that enjoyment is the most important component. College students that are physically active engage in activities that they enjoy doing (Brown, 2005; Henry, Anshel and Michael, 2006; Hildebrand and Johnson, 2001; Keating et al., 2005; Kilpatrick, Herbert and Bartholomew, 2005; Kraemer et al, 2001; Leslie et al, 1999; Nahas, Goldfine and Collins, 2003; Simmons et al., 2003; Turner, Rjeski and Brawley, 1997). Although they vary in importance by gender or type of activity (sports vs. exercise), other reasons given for being active include interest in the activity, appearance, strength and endurance, affiliation, challenge and competition, social
recognition, stress management, and weight management. Health benefits were not a motivator for most students (Brown, 2005; Hildebrand and Johnson, 2001; Keating et al., 2005; Kilpatrick et al., 2005).

A questionnaire completed by 233 undergraduates (101 men and 132 women) found competition and social recognition to be very important to physically active men (Kilpatrick et al., 2005). This group used sports as a way to “look good” in the eyes of others, either by winning or being the best at something. They were more concerned about their perceived athletic reputation and less concerned about how good they look in their clothes or living a healthy lifestyle. Enjoyment was highly linked to sports for these men. Exercise was looked at as a way to get fit and perform better. The women surveyed enjoyed sports and exercise equally, but focused on exercise as a way to improve their appearance (Kilpatrick et al., 2005). As a group, they were less concerned with competition and social recognition than physically active men are; they were more likely to use physical activity as a way to make themselves look more attractive to physically active men.

It is important to look at the intrinsic vs. extrinsic motivations for why college men and women exercise or actively participate in sports. College students exercised more frequently and with greater intensity when they participated in sports (Kilpatrick et al., 2005). The initial reasons to exercise were usually appearance-related or other extrinsic motivators (to lose weight or improve appearance for an upcoming event). Sports participation was strongly linked to enjoyment and other intrinsic motivators (challenge of competition, skill improvement or a chance to hang with friends). The
authors suggested that long term benefits are most likely to be intrinsically motivating. An extrinsic motivator may be initially motivating, but the most active students are those who find an intrinsic motivator to maintain the behavior.

Another avenue for college students to become physically active is through college physical education (PE) courses. The results of a survey study of 812 college students found that most students took a PE class either because they enjoyed or were interested in the activity (Hildebrand and Johnson, 2001). Other reasons that men participated were because they needed the credit or for an easy good grade. Women wanted to improve their health/fitness or as a way to workout. None of those surveyed were required to take a PE class in order to graduate. Students participated in a class because of previous positive experiences with respect to this activity.

While looking at the habits and behaviors of active college students is important, a more complete picture is provided by examining the habits and behaviors of inactive students. Researchers in Australia studied the habits of inactive undergraduate college students (Leslie et al., 1999). A random distribution of questionnaires resulted in 2,729 participants from 19 different schools across 31 different academic departments. Three-fourths of the participants were either freshmen (53%) or sophomores (27%). The characteristics of inactive college students differed from active college students in three ways: (a) they enjoyed fewer activities, (b) they lacked support from friends and family, and (c) most were unemployed.

Many of the issues raised in the literature have been reinforced in the meta-analysis study of college students’ physical activity behaviors published in by Keating et
College students are not engaging in healthy behaviors and they are not necessarily going to change as a result of receiving education to do so. More promotional strategies on physical activity on campus are needed in order to engage students in activities that they enjoy. This is important because 85% of active college students were found to still be active ten years later and 81% of inactive college students were still inactive ten years later. Enjoyment, living environment, plus the influence of family and friends appear to be having the greatest influences on a student’s decision to engage in physical activities.

Prior Influence and Family Environment

How important are childhood eating experiences? A mail survey of 546 college students (18-to-23-years-old) compared present eating habits with childhood recollections. Nearly all of the students continued habits in college that were developed during childhood and adolescence (Branen and Fletcher, 1999).

This agrees with the Food Choice Process Model’s concept that eating behavior ideals are formed in childhood, usually from your parents. (Furst, Connors, Bisogni, Sobal and Falk, 1996). The way these 29 adults (between the ages of 20 and 70 years old) were taught to eat as children provided a persuasive cultural tradition and image of how eating behavior should be. These participants felt the need to justify why, as adults, they strayed from childhood cultural ideal eating behaviors.

There is also literature supporting the idea that food choices deteriorate as adolescents gain independence over their own diet (Jabns et al., 2001; Lytle et al., 2000;
Nielsen et al., 2002; Neumark-Sztainer et al., 2002). Since there is evidence that college eating and physical activity habits may initially be formed during their adolescent years, several studies on teenage behavior will be briefly summarized.

Researchers, following a cohort of 291 students through elementary school, discovered that as the children got older, eating habits went in an unhealthy direction, with most significant change happening between 5\textsuperscript{th} grade and 8\textsuperscript{th} grade. (Lytle et al., 2000). Other researchers have found the deterioration of eating habits to continue throughout high school (Neumark-Sztainer et al., 2002; Nielsen et al., 2002). When comparing the trends from Nationwide Food Consumption Survey (NFCS) 1977-1978, Continuing Survey of Food Intake by Individuals (CSFII) 1989-91 and CSFII 1994-96 for adolescents (12-to-18-years-old) and young adults (19-to-29-years-old), researchers found that both age groups ate poorly and eating habits worsened with age (Nielsen et al., 2002). These trends indicate that children, adolescents and young adults are all snacking more without cutting back on regular meals. Looking at data from the past 30 years, researchers have estimated snacking to increase total energy consumed by adolescents by at least 30% (Jabns et al., 2001).

Similar to what was found among college students, a connection between physical activity and eating behaviors was found among high school students (Croll et al., 2006). When researchers looked at the eating patterns of 4,746 adolescents (11-to-18-years old), they found adolescents who were involved in sports to eat significantly better than their noncompetitive peers.
Establishing Behaviors

Even OSU students who live in the dormitory have to make choices concerning what they will eat and how active they will be. Most dining halls on campus are food court style. Students must choose from the many options offered at any given time. If they live off-campus they must decide how to get to the store, what food to purchase, how to pay for it, and then how to prepare this food once it gets home. For many students, college is the first living environment that has forced them to make all of these decisions on their own.

What was their environment like before they arrived at college? Story et al. (2002) developed a model that provides a framework for understanding adolescent behavior and provides some insight as to the mindset of freshmen as they enter college.

Similar to findings of research on college students, taste has the most and health claims have the least influence upon the daily food choices of teenagers (Cason and Wenrich, 2002; Horacek and Betts, 1998; Story et al., 2002). Boys eat everything in sight, while girls often skip meals (Story et al., 2002). Research suggests that this influence may continue during the college years (Eldridge and Murcott, 2000; Mooney and Walbourn, 2001). When surveyed, college men were most likely to avoid food they did not like (usually vegetables). Women were most likely to avoid food that they liked (chocolate and meat), in order to maintain or lose weight (Mooney and Walbourn, 2001).

Lifestyle influences include time, convenience, cost, meal patterns and dieting (Story et al., 2002). A teen’s day is structured and food choices are usually dictated by what is easily accessible. Interviews with teenagers and their parents revealed that
families are time sensitive (Eldridge and Murcott, 2000). Teens and parents are often
deterred by food choices that are labor intense, even when they enjoy the food.

College changes a teen’s lifestyle is by de-emphasizing structure. No longer must
you stay at school from 8:00AM to 3:00PM every day. It is now your responsibility to
show up when class is scheduled to start and you are permitted to leave as soon as class
finishes. Classes are no longer restricted to being offered between the hours of 8:00AM
and 3:00PM. Some days classes will start as early as 7:00AM and can end as late as
10:00PM. This creates new challenges in the life of a college freshman. While the
structure changes upon entrance to college, there is evidence that food choices are still
ddictated by what is available. Due to financial constraints and convenience, one boy
interviewed by Eldrige and Murcott (2000) chooses to eat whatever mom packs for lunch,
even after starting college.

Socially, the greatest influence on teen eating habits is family (Fulkerson,
Neumark-Sztainer, and Story, 2006; Neumark-Sztainer et al., 2000; Story et al., 2002;
Young and Fors, 2001). The family provides food and influences attitudes. Peers were
not found to be a strong influence on eating behaviors (Story et al., 2002), but they were
influential concerning other teen behaviors (Johansen, Rasmussen, and Madsen, 2006;
Lau, Quadrel, and Hartman, 1990). A Danish study found that friend-oriented teens were
influenced by friends when it came to risky behaviors, such as drinking, smoking and
drug use, but parents had more influence concerning breakfast consumption
(Johansen et al., 2006).
College changes a person’s social structure. For most students, mom and dad live too far away to continue to make daily food and activity choices for their child. Now students must either make their own choices or follow along with what their friends and roommates are doing. When surveyed, one group of 532 college students felt that peers were most influential concerning physical activity and alcohol consumption, while parents continued to strongly influence eating behaviors (Lau et al. 1990). These authors identified the college years as a window of vulnerability, where parental influence will endure provided that the child has not been exposed to different behaviors during this vulnerable time in life.

While Lau et al. (1990) found direct modeling of both parents and peers to be a strong influence on eating behaviors of college students, the influence of media was not mentioned. When 490 adults (ages 19 to 64 years old) were surveyed, direct modeling had very little effect on the group and media had a tremendous impact (Sheeska, Woolcott and MacKinnon, 1993). In addition to the media, these adults were influenced by self-efficacy and disincentives. Perhaps college students are at a crossroads. Parents and peers are presently important influences on their lives, but there are indications that this may change as they age.

If parents are no longer available to help make daily decisions, how do college students make choices concerning food? Furst et al. (1996) interviewed 29 adults between the ages of 20 and 70 years old in order to create the Food Choice Process Model to explain why adults make the food choices that they do. There is evidence that this model applies to college students’ choices as well (Cason and Wenrich, 2002;
Horacek and Betts, 1998). The same common values identified in this model were identified in the findings of Phase Two.

The Food Choice Process Model uses a personal system to look at how past food purchases influence future food choices (Furst et al., 1996). One component of this model looks at value negotiations, where competing values are weighed and measured when making a food choice. Sometimes these values exist in harmony and other times in conflict. When conflict ensues, one value will emerge as the dominant factor. This dominant factor is used to develop individual strategies that simplify future food choices. This model identifies 6 common values:

1. Sensory perceptions include physical properties such as taste, texture, odor and appearance. Taste is the dominant perception; it usually takes precedence over all other values.

2. Monetary considerations are the price and perceived worth of the food to be purchased. For some consumers, this means purchasing the cheapest food possible. For others, this means deciding whether or not the quality of the food is worth the price one has to pay for it. Monetary considerations often conflict with taste and convenience.
3. Convenience not only looks at how much time is involved, but also how easy the food is to find at the store and to prepare once you get home. Many consider time as a commodity to be negotiated with other values.

4. Health and nutrition includes disease avoidance, weight control and well-being. Health is associated with foods to avoid; nutrition is looked at more positively.

5. Managing relationships is usually identified by the person making food choices for a family. While this person has control over what the family eats, accommodations are often made in order to keep peace around the dinner table.

6. Quality means different things to different people, but usually is associated with a higher price. Quality is usually valued more than cost, because it is often associated with taste.

One model examined factors that influence physical activity and serves as a basis to promote physical activity, for both the high school and college level young adults (Nahas et al., 2003). The determinants of physical activity were characterized as barriers and promoters. Lack of time, money, facilities, and/or an exercise partner; a dislike of exercise and anxiety over stress in one’s life were all identified as barriers to exercise. In order to promote exercise, enjoyment is essential, but is perceived differently by different people. Positive support from family, friends and instructors, was also important.
Conclusion

How college impacts the eating and physical activity habits of freshmen college students is not well understood. What motivates young people to adapt or maintain good habits is not clear. There is some evidence about how eating behaviors are influenced, but less is known about encouraging activity, especially among the inactive. It is possible that being active is associated with better eating habits, but as many as two-thirds of college students are inactive. Several studies have surveyed college students, in order to gain insight into their eating and/or physical activity habits. This has provided some insight into those behaviors, but we do not really understand why college students make the behavior related choices that they make.

This research was an effort to determine weight stability and to explore the factors influencing eating and physical activity habits, among undergraduate students attending Oregon State University (OSU) during the 2004-2005 school year. Concerning weight stability, this study is unique in three ways: (a) the researchers collected all anthropometric measurements, (b) the sample size was larger than any study found in the literature and (c) the majority of participants were male (60%). Focus groups were used to identify themes found common to one group of college undergraduate students, in regards to their eating and physical activity habits. Due to its size and nature, it is not assumed that the results of this focus group analysis can be generalized.
METHODS

Study Design

The purpose of this research was to measure weight stability and to explore the factors influencing eating and physical activity habits among undergraduate students attending Oregon State University (OSU) during the 2004-2005 school year. It included two phases. Phase One involved having students complete a short questionnaire, along with collecting anthropometric measurements (weight and height), at the beginning (week two) of fall quarter 2004. A follow up weight was collected at the end (week ten) of fall quarter 2004. Phase Two consisted of five focus groups conducted during spring quarter 2005. The focus groups were made up of Phase One students who indicated on the questionnaire their interest in participating in follow-up research (Phase Two).

Approval to conduct this study was obtained from the Oregon State University Institutional Review Board for the Protection of Human Subjects (IRB). A separate IRB request was completed for both Phases of this study. All students were given an opportunity to read and sign an informed consent form prior to the start of the study. Copies of the informed consent are found in Appendix A & B.

Phase One

Study Population

The sample for this research was taken from a population of OSU students enrolled in a course entitled “Lifetime Fitness” (HHS 241). This course was offered by the college of Health and Human Sciences (HHS). It is a requirement that every
undergraduate at OSU take HHS 241 prior to graduation, so the population is a cross-section of all undergraduates studying at OSU. The majority of students participate in this course during their freshmen or sophomore year. Most upper classmen enrolled in HHS 241 were found to be transfer students.

During fall quarter 2004, there were 16 laboratory sections of HHS 241. Approximately 40 students were enrolled in each section, making the population of Phase One to be approximately 640 students.

**Week Two Weights/Questionnaire**

During the second week of class, researchers visited each laboratory section of HHS 241, explaining what the study was about and asking for volunteers. Interested students were given an informed consent and allowed time to read it over and ask questions. After the informed consent was signed, each participant filled out a short questionnaire. Information collected included demographic data, prior family experiences and how students felt about their current weight. Upon completion, the researchers collected each questionnaire and recorded height and weight measurements for each participant, in a space provided on the questionnaire. A copy of this survey instrument can be found in Appendix C.

**Week Ten Weight**

During week ten of fall quarter 2004, a researcher returned to each of the HHS 241 laboratory sections to collect a follow-up weight for any students interested in
continuing participation. Students were asked to provide an ID number on the questionnaire from week two and then identify it in week ten, so that individual weight changes could be observed. In order to maintain anonymity, names were not collected. ID numbers were posted in numerical order, so that students could help researchers match up their weight from week two with week ten. Every effort was made to maintain anonymity. The same scale and protocol was used for both weight measurements.

_Anthropometric Measurements_

Students were asked to remove their shoes, heavy clothing and objects from their pockets prior to being measured. Heavy clothing was not an issue in week two, as the weather was unseasonably warm. Most students were in shorts and t-shirts. The weather was much cooler during week ten and many students were wearing sweatshirts and sweatpants over shorts and t-shirts. Participants were asked to think back to how they would have dressed at the beginning of the year and remove clothing accordingly.

A researcher measured the height of each student by having them stand against the wall facing forward, where a tape measure with English measurements was taped to the wall. A 2 mm board was placed lightly at the crown of the student’s head and then the student was asked to step away from the wall. Measurements were read from the bottom of the board. Each measurement was rounded to the nearest quarter inch and recorded by the researcher.
All weights were measured on the same Health-O-Meter® scale. The researcher reading the scale stood in such a way as to prevent fellow students from reading the weight when a participant was standing on the scale. Students confirmed their height/weight measurements. All weights were rounded to the nearest half-pound and recorded by a researcher.

Weight and Height measurements were used to compute a Body Mass Index (BMI) for each student, using the formula found in Lee and Nieman (2003).

\[
(1) \quad \text{weight in pounds/}(\text{height in inches}^2) \times 703.
\]

A separate BMI was calculated for weights collected in weeks two and ten. The guidelines mentioned in Lee and Nieman (2003) classify BMI numbers as follows:

1. Underweight is a BMI value of less than 18.5
2. Normal weight is a BMI value between 18.5 and 24.9
3. Overweight is a BMI value between 25.0 and 29.9
4. Obese is any BMI value greater than 29.9

These guidelines were used to categorize students as underweight, normal weight, overweight or obese in week two and to see if any students lost or gained enough weight to be in a different category by week ten of fall quarter 2004.
Phase Two

Study Population

During spring quarter 2005, students who completed both measurements and indicated on the Phase One questionnaire that they were interested in a follow-up study were contacted to see if they were still interested. Of the interested students between the age of 18 and 20-years-old, 160 had valid contact information. These students were invited to participate in a focus group lasting approximately 90 minutes. Twenty students participated in Phase Two of this study. Appendix D includes a sample invitation.

Students were told that the topic of discussion was healthy lifestyle and food choice behaviors and that the group would be made up of college students their age and gender. The day before a focus group, scheduled participants were given a reminder, either via email or telephone (depending on what they specified as their preferred method of contact). Upon completion a session, each participant received gift cards good for free food in the campus dining halls. The value of the gift cards equaled $12.00.

Composition of the Focus Groups

The researchers strived to make participants as comfortable as possible, while collecting as much data as possible. After careful consideration, it was decided to invite group participants based on weight stability and gender.

Expert focus group moderators recommend separating genders to facilitate making the participants more comfortable and forthright with their answers (Kruger and Casey, 2000). Men tend to overwhelm the group by speaking more frequently and with
more authority than the women do. This often irritates the women participating and keeps the researchers from collecting data on the women’s point of view.

Those who had gained weight were also more likely to be heavier. The researchers tried to be sensitive to the situation of having very thin participants in the same room with overweight participants, making them both self-conscious and unwilling to talk. Groups were divided up by weight stability in hopes of alleviating that problem.

**Focus Group Sessions**

Each session was conducted by the same experienced moderator, who followed a focus group script developed by the researchers (Appendix E). The moderator greeted the participants as they arrived and made them feel very comfortable. Hiring a professional, experienced moderator proved to be a great asset to this portion of the project. She provided a comfortable atmosphere that made the students feel important and willing to share their thoughts and concerns.

The master’s candidate acted as an observer. In addition to taking comprehensive notes, she prepared the room, made certain tape recorders were working and in place, got informed consents signed, provided refreshments for participants, handed out incentives, and cleaned the room upon completion. She did not participate in any discussions.

The sessions were held in 129 Bates Hall, a conference room on the campus of Oregon State University. Each met for approximately 90 minutes, some time between the hours of 5:00PM and 9:00PM. The timing of each group and incentives offered were tailored to accommodate the interests and availability of busy college students.
All participants were provided with an informed consent at the beginning of the session, with time provided to ask any questions. The session did not start until all participants had signed the informed consent found in Appendix B.

The focus groups were audio tape recorded using two micro cassette tape recorders. Each recorder was attached to an omnidirectional external microphone. The microphones were placed at opposite corners of the table. This was done to ensure that as much of the conversation as possible was recorded. To safeguard against possible equipment malfunction, the observer took comprehensive notes.

An easel with marker and paper was available for the moderator to use for summarizing ideas formulated by the group. Each person wrote his or her first name on a piece of heavy cardstock paper folded in two. In this way, the moderator could freely ask questions without confusing names. The subjects were encouraged to interact with each other, as well as the moderator. Having access to everyone’s first name made this easier to do. Only first names were used to ensure confidentiality. A blank piece of paper and a pen was also provided, as a way to jot down ideas that the students did not have time to share or preferred not to share with the group, but wanted to share with the researchers. All materials were collected at the end of each session to be used in the analysis.

The first 45 minutes of discussion focused on how the past two terms at OSU had influenced the students’ eating and physical activity habits. After this portion was completed, the moderator called for a 10 minute break. Participants had a chance to get up and stretch or get more refreshments. In the mean time, the observer flipped over the
tape over and rewound it. The questions asked in the second half of the discussion paralleled the first half, but focused on the participants’ pre-college experiences.

Upon completion of each focus group session, the observer collected all the information provided. She passed her comprehensive notes on to the other members of the research team. Before holding the next session, other members would read her notes, listen to the audio tape and provide the moderator with feedback. One audio tape from each session was sent to a professional transcriber. The resulting transcriptions were used by the researchers for data analysis. The data collected was meant to examine the eating and physical activity habits of one group of undergraduate college students. It is not possible to assume that these opinions are those of college students in general.

Phase One Data Analysis

The data collected from Phase One was used to answer the research question regarding weight stability. Answers collected from the questionnaire were entered onto an Excel spreadsheet. After week ten, the entries were checked for completeness. A response was considered complete if it contained all anthropometric measurements collected in week two and week ten. After the spreadsheet was edited to include only complete responses, it was converted into a Stata 8 data file. All quantitative analysis was done with the aid of a Stata 8 statistical software package.
**Weight Data**

Weights collected in weeks two and ten were analyzed using a paired t-test. A paired t-test is used to test for any changes that occur to the same data set over time (Gravetter and Wallnau, 2004). It computes the difference between the data collected in week two with the data collected in week ten for each subject and tests to see if the difference is statistically different from 0. This test was used to determine the weight stability of the Phase One participants. No other researchers were found to have collected anthropometric measurements first hand on more than 300 subjects nor were any found to have such a high percentage of male participants (60%).

Because each BMI category falls into a specific range of values, histograms for each time period (week two and week ten) were included. Both histograms will display the frequency that students were underweight, normal weight, over weight and obese.

**Demographic Data**

Demographic data included age, gender, race, academic major, community background, family structure, and current residence. This data was tabulated and/or summarized. In order to make data concerning majors more manageable, it was decided to combine multiple major responses into their respective colleges: Agricultural Sciences, Business, Education, Engineering, Forestry, Health and Human Sciences, Liberal Arts, and Other Sciences. Other Sciences included Oceanic and Atmospheric Sciences, Pharmacy, Science, and Veterinary Medicine. Whenever possible, demographics were compared to the demographics of freshmen and sophomores attending OSU during the
Six questions were asked concerning family meal patterns prior to entering college. These questions were tabulated and analyzed along with family structure and community in order to better understand student habits prior to entering college.

Two questions looked at how the students feel about their physical appearance. Question 1 asked the students to describe themselves, using a five scale value ranging from very underweight to very overweight. Question 2 uses a four scale value to ask students whether they are trying to lose weight, gain weight, stay the same or nothing at all. A chi-square test for independence was used to see if how students feel about themselves matches up with how their BMI values categorize their weight. A second test looked at how they described themselves matched up with whether or not they are currently trying to lose weight, gain weight, maintain weight or nothing at all. These tests will be able to distinguish any differences between how males and females view their weight status. As described in Gravetter and Wallnau (2004), chi-square is a statistic used to test whether or not there is a relationship between two variables. This alternative is used when data consists of frequencies instead of numerical scores.

Phase Two Data Analysis

After all of the sessions were completed and transcribed, the researchers were ready to analyze the data. This analysis occurred in three phases, as described by Miles and Huberman (1994). First of all, each researcher (individually) read through the
transcripts and identified comments and key words that fit within the research questions. This phase is called data reduction; it reduced the data so that it focused the questions at hand. Secondly the research team (as a group) composed a list of common patterns and themes to compare and contrast between subjects. Five factors were considered: (a) specific words, (b) context, (c) internal consistency, (d) specificity of responses and (e) patterns that developed in the focus group session. This phase is referred to as data display. Thirdly, the themes developed in phase 2 (data display) were used to code the data (coding process). The coding process was a way to allow for identification of key constructs for assessment and comparison of data gathered. It occurred in three steps:

1. Open coding compared transcripts containing central categories or properties to those without. Transcripts from the men’s focus groups will be compared those from the women’s focus groups.

2. Axial coding was used to analyze one specific category at a time. Such as, how students feel about their dining choices on campus.

3. After steps 1 & 2 were completed, the data was summarized and broad concepts were developed. This allowed selective coding to be verified and conclusions to be drawn on the qualitative data.
Two members of the research team independently coded the data. One researcher chose to use the long table method (Kruger and Casey, 2000). This simple “cut and paste” procedure manually separates comments collected throughout the focus group transcripts and notes into the designated themes. Kruger recommends this method for novice focus group analyzers. The other researcher chose to use a qualitative software program, to go through the same process.
RESULTS OF PHASE ONE

The purpose of this research was to measure weight stability and to explore the influences upon eating and physical activity habits among a sample of undergraduate students attending Oregon State University (OSU) during the 2004-2005 school year. Weight and height data collected weeks two and ten (Phase One) was used to determine weight stability. A questionnaire distributed during week two of Phase One included several demographic questions, which give some background information concerning family life and perceptions prior to entering OSU.

Weight Data

Data from 379 volunteers, who were weighed in both week two and week ten, were used for this analysis. An overall average weight gain of 2.62 pounds was revealed during this eight week period. Nearly two-thirds of participants (60% of women and 64% of men) gained at least one-half pound. Between week two and week ten, 122 students (32%) gained at least five pounds and 257 students (68%) either lost weight, maintained weight or gained less than 5.0 pounds during fall quarter 2004. Results of a pared t-test indicate that this weight gain was significant (\(M = 2.62 \text{ pounds}, SD = 5.42 \text{ pounds}\)) between week two and week ten of fall quarter 2004 (Table 1), \([t(378) = -9.41, p < .05]\).
Table 1

Paired t-test of weights from week 2 and week 10

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Err.</th>
<th>Std. Dev.</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight~2</td>
<td>379</td>
<td>156.15</td>
<td>1.70</td>
<td>33.08</td>
<td>152.81 159.49</td>
</tr>
<tr>
<td>weight~10</td>
<td>379</td>
<td>158.77</td>
<td>1.72</td>
<td>33.43</td>
<td>155.40 162.15</td>
</tr>
<tr>
<td>diff</td>
<td>379</td>
<td>-2.62</td>
<td>.28</td>
<td>5.42</td>
<td>-3.17 -2.08</td>
</tr>
</tbody>
</table>

Ho: mean(weight_wk__2 - weight_wk__10) = mean(diff) = 0
Ha: mean(diff) < 0    Ha: mean(diff) != 0    Ha: mean(diff) > 0
  t =  -9.4198          t =  -9.4198               t =  -9.4198
  P < t =   0.0000      P > |t| =  0.0000         P > t =  1.0000

The Body Mass Index (BMI) formula found in Lee and Nieman (2003) uses weight and height to estimate healthy weight status. The BMI formula is reported in the methods. BMI data can be found in Table 2. Seventy percent of participants maintained a healthy weight throughout this study, yet the mean value increased by 0.40 of a point from week two to week ten. Most participants (90%) did not lose or gain enough weight to change BMI classification into an unhealthy weight.

Of the 10% who did change categories, 31 students (8%) got heavier and 6 students (2%) got lighter. By the end of week ten, 28% of students were classified as overweight or obese. This is a 3% increase from the 25% classified as overweight or obese during week two. The histograms in Figure 1 show how the BMI values shifted between week two and week ten.
Table 2

Summary of BMI statistics

<table>
<thead>
<tr>
<th>Time</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week two</td>
<td>379</td>
<td>23.24</td>
<td>3.82</td>
<td>15.33</td>
<td>41.44</td>
</tr>
<tr>
<td>Week ten</td>
<td>379</td>
<td>23.64</td>
<td>3.88</td>
<td>15.33</td>
<td>41.02</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week Two BMI</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>underweight</td>
<td>19</td>
<td>5.01 %</td>
</tr>
<tr>
<td>normal weight</td>
<td>266</td>
<td>70.18 %</td>
</tr>
<tr>
<td>overweight</td>
<td>72</td>
<td>19.00 %</td>
</tr>
<tr>
<td>obese</td>
<td>22</td>
<td>5.80 %</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.00 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week Ten BMI</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>underweight</td>
<td>13</td>
<td>3.43 %</td>
</tr>
<tr>
<td>normal weight</td>
<td>259</td>
<td>68.34 %</td>
</tr>
<tr>
<td>overweight</td>
<td>79</td>
<td>20.84 %</td>
</tr>
<tr>
<td>obese</td>
<td>28</td>
<td>7.39 %</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.00 %</td>
</tr>
</tbody>
</table>
Figure 1. A Comparison of Student BMIs during weeks 2 & 10
One question on the instrument asked students to describe their perception for weight. On a 1-5 scale were the responses “very underweight”, “slightly underweight”, “about the right weight”, “slightly overweight”, or “very overweight”. Table 3 compares the two-way cross tabulations of weight perception with the student’s BMI classification (underweight, normal weight, over weight or obese). Pearson $\chi^2$ values indicate that there is a relationship between BMI value and students’ self perception for weight. For females, $\chi^2 (9, n = 151) = 98.89, p < .05$ and for males, $\chi^2 (12, n = 227) = 91.25, p < .05$

Table 3

Two-Way Cross Tabulation of How Student Describes Weight & BMI Classification

<table>
<thead>
<tr>
<th>How female * student describes her weight status</th>
<th>under weight</th>
<th>normal weight</th>
<th>over weight</th>
<th>obese</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>slightly underweight</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>about the right weight</td>
<td>6</td>
<td>68</td>
<td>1</td>
<td>1</td>
<td>76</td>
</tr>
<tr>
<td>slightly overweight</td>
<td>1</td>
<td>36</td>
<td>16</td>
<td>5</td>
<td>58</td>
</tr>
<tr>
<td>very overweight</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>total</td>
<td>14</td>
<td>108</td>
<td>20</td>
<td>9</td>
<td>151</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How male ** student describes his weight status</th>
<th>under weight</th>
<th>normal weight</th>
<th>over weight</th>
<th>obese</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>very underweight</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>slightly underweight</td>
<td>2</td>
<td>30</td>
<td>2</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>about the right weight</td>
<td>3</td>
<td>108</td>
<td>26</td>
<td>2</td>
<td>139</td>
</tr>
<tr>
<td>slightly overweight</td>
<td>0</td>
<td>14</td>
<td>26</td>
<td>7</td>
<td>47</td>
</tr>
<tr>
<td>very overweight</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>total</td>
<td>5</td>
<td>152</td>
<td>55</td>
<td>13</td>
<td>227</td>
</tr>
</tbody>
</table>

* Pearson $\chi^2 (9) = 98.8901$ Pr = 0.000 females’ perception is significantly related to BMI classification.

** Pearson $\chi^2 (12) = 91.2503$ Pr = 0.000 males’ perception is significantly related to BMI classification.
The results, separated by gender, reveal that women were more likely than men to describe themselves as heavier than their BMI classification. BMI values below 18.5 are considered underweight. Six women had a BMI value less than 17.0 (lowest value = 15.33), but none described themselves as “very underweight”. None of the men had a BMI of less than 17.0 and both of the men who described themselves as “very underweight” had a BMI classification in the normal weight range.

Thirty-seven men described themselves as “very underweight” or “slightly underweight”. Two of these men were classified as underweight. Thirty of the men were normal weight. Two of the men were overweight and one was obese.

Seven of the nine women who identified themselves as “slightly underweight”, had a BMI value of less than 18.5. Two of these women had normal weight BMI values. None were overweight or obese.

The majority of women describing themselves as “about the right weight” had a healthy BMI classification. Others were underweight (n=6), overweight (n=1), or obese (n=1).

For men describing themselves as “about the right weight”, most had a healthy BMI classification. Others were underweight (n=3), overweight (n=26) or obese (n=2).

A large group of women described themselves as overweight, but only 29 had an unhealthy BMI classification. Only one overweight woman and one obese woman described their weight as “about the right weight”.

Of 68 men with an unhealthy BMI classification, only 37 described themselves as “slightly overweight” or “very overweight”. At the same time, all men who described themselves as “very overweight” had an unhealthy BMI classification.

Another question asked participants to respond using a 1-4 scale if they were trying to “reduce weight”, “gain weight”, “stay the same weight” or “not trying to do anything about my weight”. A two-way cross tabulation compares students’ perception of current weight with intentions concerning weight stability (Table 4). Pearson $\chi^2$ values indicate that there is a relationship between how students describe themselves and what they are trying to do about their weight. For females, $\chi^2 (12, n = 151) = 71.80, p < .05$; for males, $\chi^2 (16, n = 227) = 133.17, p < .05$.

Table 4

<table>
<thead>
<tr>
<th>Perception of current weight</th>
<th>very under weight</th>
<th>slightly under weight</th>
<th>about the right weight</th>
<th>slightly over weight</th>
<th>very over weight</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>reduce weight</td>
<td>0</td>
<td>2</td>
<td>31</td>
<td>51</td>
<td>7</td>
<td>91</td>
</tr>
<tr>
<td>gain weight</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>stay the same</td>
<td>0</td>
<td>3</td>
<td>28</td>
<td>4</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>do nothing</td>
<td>0</td>
<td>1</td>
<td>15</td>
<td>2</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>no response</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>total</td>
<td>0</td>
<td>9</td>
<td>76</td>
<td>58</td>
<td>8</td>
<td>151</td>
</tr>
</tbody>
</table>
Table 4 (cont)

Male **

Perception of current weight

<table>
<thead>
<tr>
<th>Intentions concerning weight stability</th>
<th>very under weight</th>
<th>slightly under weight</th>
<th>about the right weight</th>
<th>slightly over weight</th>
<th>very over weight</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>reduce weight</td>
<td>0</td>
<td>2</td>
<td>10</td>
<td>35</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>gain weight</td>
<td>2</td>
<td>22</td>
<td>43</td>
<td>1</td>
<td>0</td>
<td>68</td>
</tr>
<tr>
<td>stay the same</td>
<td>0</td>
<td>4</td>
<td>48</td>
<td>3</td>
<td>1</td>
<td>56</td>
</tr>
<tr>
<td>do nothing</td>
<td>0</td>
<td>7</td>
<td>36</td>
<td>6</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td>no response</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>total</td>
<td>2</td>
<td>35</td>
<td>139</td>
<td>47</td>
<td>4</td>
<td>227</td>
</tr>
</tbody>
</table>

*Pearson $\chi^2(12) = 71.8002$  $Pr = 0.000$ females’ perception is significantly related to intentions concerning weight stability.

** Pearson $\chi^2(16) = 133.1696$  $Pr = 0.000$ males’ perception is significantly related to intentions concerning weight stability.

Sixty percent of the women surveyed were trying to reduce their weight. One-third (34%) of the women who described themselves as “about the right weight” were trying to reduce their weight. Four women (3%) were trying to gain weight.

Twenty-two percent of men were trying to reduce their weight and 30% were trying to gain weight. Two thirds (63%) of men who felt they were “about the right weight” were trying to gain weight (Table 4).

Even though most other weight stability studies found in the literature were small and predominantly women, the percentage of students gaining weight in those studies appeared to be very similar to the findings of this study. Sixty percent of all women gained weight and sixty-six percent of all men gained weight. Two-thirds of participants (60%) remained relatively weight stable (lost or gained no more than four pounds), 8%
lost at least 5.0 pounds and 32% gained at least 5.0 pounds. While 60% of the women in this study stated that they were trying to lose weight and 22% men stated that they were trying to lose weight, the percentage of weight gain and loss was very similar between the groups. The breakdown of weight change by gender can be found in Table 5.

Table 5

Weight Change by Gender

<table>
<thead>
<tr>
<th>Weight Change:</th>
<th>women</th>
<th>%</th>
<th>men</th>
<th>%</th>
<th>total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of more than 10 pounds</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>1%</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Loss of 5 to 10 pounds</td>
<td>7</td>
<td>5%</td>
<td>19</td>
<td>8%</td>
<td>26</td>
<td>7%</td>
</tr>
<tr>
<td>4 pound loss to 4 pound gain</td>
<td>97</td>
<td>64%</td>
<td>132</td>
<td>58%</td>
<td>229</td>
<td>60%</td>
</tr>
<tr>
<td>Gain of 5 to 10 pounds</td>
<td>37</td>
<td>25%</td>
<td>63</td>
<td>28%</td>
<td>100</td>
<td>26%</td>
</tr>
<tr>
<td>Gain 11 to 15 pounds</td>
<td>7</td>
<td>5%</td>
<td>9</td>
<td>4%</td>
<td>16</td>
<td>4%</td>
</tr>
<tr>
<td>Gain of more than 15 pounds</td>
<td>3</td>
<td>2%</td>
<td>3</td>
<td>1%</td>
<td>6</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100%</td>
<td>228</td>
<td>100%</td>
<td>379</td>
<td>100%</td>
</tr>
</tbody>
</table>

Demographic Data

While the age of participants ranged from 17 to 39 years-old, 86% of participants were between 18 and 20 years-old and 70% had never lived away from home before coming to OSU. The mean age was 19 years-old with a standard deviation of 2.11 years. More men (60%) participated in Phase One than women (40%).

As presented in table 6, non-Caucasian participants totaled 14.77%. According to Oregon State University (OSU General Catalog, 2006), 14.5% of the current population are students of color.
Table 6

Race of Participants

<table>
<thead>
<tr>
<th>Race</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian or Native Alaskan</td>
<td>6</td>
<td>1.58%</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>27</td>
<td>7.12%</td>
</tr>
<tr>
<td>Black, not Hispanic</td>
<td>1</td>
<td>0.26%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6</td>
<td>1.58%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>323</td>
<td>85.22%</td>
</tr>
<tr>
<td>Other Race</td>
<td>10</td>
<td>2.64%</td>
</tr>
<tr>
<td>Declined to answer</td>
<td>6</td>
<td>1.58%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>379</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>

Table 7

Frequency and Percentage of Students enrolled in each academic college

<table>
<thead>
<tr>
<th>Academic College</th>
<th>Frequency</th>
<th>Percent</th>
<th>Percent of OSU undergraduate students enrolled in Fall 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture Sciences</td>
<td>22</td>
<td>5.80%</td>
<td>6.96%</td>
</tr>
<tr>
<td>Business</td>
<td>89</td>
<td>23.48%</td>
<td>14.00%</td>
</tr>
<tr>
<td>Education</td>
<td>5</td>
<td>1.32%</td>
<td>0.17%</td>
</tr>
<tr>
<td>Engineering</td>
<td>82</td>
<td>21.64%</td>
<td>19.30%</td>
</tr>
<tr>
<td>Forestry</td>
<td>10</td>
<td>2.64%</td>
<td>2.42%</td>
</tr>
<tr>
<td>Health and Human Sciences</td>
<td>42</td>
<td>11.08%</td>
<td>14.30%</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>42</td>
<td>11.08%</td>
<td>19.05%</td>
</tr>
<tr>
<td>Other Sciences</td>
<td>67</td>
<td>17.68%</td>
<td>17.74%</td>
</tr>
<tr>
<td>Undecided</td>
<td>20</td>
<td>5.28%</td>
<td>6.06%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>379</strong></td>
<td><strong>100.00%</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>
Each undergraduate major was represented in this study. Table 7 shows a breakdown of how this compares with the declared majors of undergraduate students attending OSU in 2004 (OSU General Catalog, 2004).

For 70% of Phase One participants, this was the first time they have lived away from home. Only one-third (34%) of students chose to live in an off-campus dwelling, where they need to provide for their own meals. The other two-thirds chose to live in an environment where both room and board are provided. Table 8 shows a breakdown of current housing choices. The Residence Halls is where nearly two-thirds (59%) of the students chose to reside.

Table 8

<table>
<thead>
<tr>
<th>Type of housing</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residence Hall or Co-op house</td>
<td>222</td>
<td>58.58 %</td>
</tr>
<tr>
<td>Greek House</td>
<td>23</td>
<td>6.07 %</td>
</tr>
<tr>
<td>Off-campus house or apartment</td>
<td>127</td>
<td>33.51 %</td>
</tr>
<tr>
<td>Live with parents</td>
<td>7</td>
<td>1.85 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>379</strong></td>
<td><strong>100.00 %</strong></td>
</tr>
</tbody>
</table>

Tables 9 & 10 provide information on the pre-college environment. Most participants lived in a city (71%) and grew up in a household with two parents (80%). More than half of participants (56%) grew up in an environment where both parents worked outside of their home.
Table 9

A Breakdown of Hometown Community by Size

<table>
<thead>
<tr>
<th>Size of Hometown</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm or rural area</td>
<td>53</td>
<td>13.98%</td>
</tr>
<tr>
<td>A town of less than 10,000 people</td>
<td>51</td>
<td>13.46%</td>
</tr>
<tr>
<td>A city between 10,000 and 100,000 people</td>
<td>152</td>
<td>40.11%</td>
</tr>
<tr>
<td>A city/suburb over 100,000 people</td>
<td>117</td>
<td>30.87%</td>
</tr>
<tr>
<td>Uncertain/no answer</td>
<td>6</td>
<td>1.58%</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table 10

Types of Family Structure Students Grew Up With

<table>
<thead>
<tr>
<th>Family structure</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lived with two parents &amp; both worked *</td>
<td>214</td>
<td>56.47%</td>
</tr>
<tr>
<td>Lived with two parents &amp; father worked *</td>
<td>79</td>
<td>20.84%</td>
</tr>
<tr>
<td>Lived with two parents &amp; mother worked *</td>
<td>9</td>
<td>2.37%</td>
</tr>
<tr>
<td>Lived with mother &amp; mother worked *</td>
<td>29</td>
<td>7.65%</td>
</tr>
<tr>
<td>Lived with father &amp; father worked *</td>
<td>12</td>
<td>3.17%</td>
</tr>
<tr>
<td>Other family structure</td>
<td>33</td>
<td>8.70%</td>
</tr>
<tr>
<td>No reply</td>
<td>3</td>
<td>0.80%</td>
</tr>
<tr>
<td>Total</td>
<td>379</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

* worked outside of the home.

Table 11 shows the breakdown of six questions concerning family eating patterns.

Two-thirds of participants (68%) ate home prepared meals as a family on most days.

Another 5% ate meals as a family on weekends only. One-fourth (24%) believed that there was no pattern for home prepared meals, or had no consistency at all in their eating patterns. Thirteen percent of participants bought and/or fixed food for themselves.
### Pre-College Meal Patterns

<table>
<thead>
<tr>
<th>Meal Pattern</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ate meals as a family most days</td>
<td>257</td>
<td>68%</td>
</tr>
<tr>
<td>Ate meals as a family on weekends only</td>
<td>20</td>
<td>5%</td>
</tr>
<tr>
<td>No pattern for home prepared meals</td>
<td>67</td>
<td>18%</td>
</tr>
<tr>
<td>Usually ate food that I bought</td>
<td>14</td>
<td>4%</td>
</tr>
<tr>
<td>Usually ate food that I fixed</td>
<td>33</td>
<td>9%</td>
</tr>
<tr>
<td>Little consistency to pre-college eating</td>
<td>21</td>
<td>6%</td>
</tr>
</tbody>
</table>
FINDINGS OF PHASE TWO

While quantitative analysis was used to determine weight stability, qualitative analysis was used to explore the perceptions of eating and physical activity habits, as well as the college living influences upon those habits, among undergraduate students attending Oregon State University (OSU) during the 2004-2005 school year. The quantitative results have been described. The qualitative results were explored using a focus group method and they address the remaining three questions:

2: How does college life influence food choices and consumption patterns?
3: How does college life influence physical activity and exercise patterns?
4: Do “pre-college” behaviors and influences have an impact on eating and exercise behaviors in college?

Focus Group Discussion Reoccurring Themes

The themes developed by the research team were used to analyze focus group outcomes into reoccurring and/or important ideas. Following is a list of the reoccurring themes identified by the research team (Table 12).
Table 12

Focus Group Discussion Reoccurring Themes

<table>
<thead>
<tr>
<th></th>
<th>Students could cite an accurate definition of healthy living, but expressed inconsistent understanding and misperceptions about living healthy lifestyles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Students perceived positive influences in their current environment to be supportive of healthy lifestyle behaviors.</td>
</tr>
<tr>
<td>3</td>
<td>Students perceived obstacles in their current environment toward healthy lifestyle behaviors.</td>
</tr>
<tr>
<td>4</td>
<td>Healthy lifestyles are practiced as a function of intrinsic motivation and/or lifelong habits and family influences.</td>
</tr>
<tr>
<td>5</td>
<td>Some students struggle with the life skills, experience and discipline needed to manage their behaviors.</td>
</tr>
<tr>
<td>6</td>
<td>Coming to college has changed students’ support system, relevant to healthy living.</td>
</tr>
<tr>
<td>7</td>
<td>Students are surprised at the difficulty in managing healthy behaviors and attempt to develop strategies to manage their behavior and weight.</td>
</tr>
</tbody>
</table>

Students Could Cite an Accurate Definition of Healthy Living, but Expressed Inconsistent Understanding and Misperceptions about Living Healthy Lifestyles

While the literature has identified knowledge as essential to practicing healthy lifestyle behaviors, there are indications that knowledge alone will not improve students’ eating and exercise habits (Cason and Wenrich, 2002; Farrell, 2002; Herzler and Frary, 1989; Horacek and Betts, 1998). There is also evidence that most college students have a good knowledge base, but may not choose healthy options (Cason and Wenrich,
2002; Horacek and Betts, 1998). Each focus group began by asking participants to define a healthy lifestyle.

All participants could recite a textbook sounding, holistic definition: a healthy lifestyle consists of a balance between physical activity, nutrition, mental/emotional/spiritual health and being social. At the same time, there were indications that the students often struggled to find this balance.

…I think it’s basically to have a good balance between physical health, emotional health, social health, and for some people spiritual health…Being able to balance them all out and making sure not to stress on one, as often happens…(male participant).

Throughout the discussions, participants were identifying foods that they considered “good” or “bad” for them. A list of these foods can be found in Appendix F. While they appeared to have some education as to what it means to live a healthy lifestyle, most focus group participants described dichotomous choices in absolute terms. Entire categories of food were labeled as either “good” or “bad”. For instance, most participants identified anything made at home or by their house’s cook as “good” and anything purchased at a fast food restaurant or in the dining halls as “bad”. Fruits and vegetables, chicken and rice were identified as “good”; anything “greasy”, hamburgers and French fries were considered “bad”

Participants also referred to their habits as being “good” or “bad”. Men talked a lot about the restaurants near campus and believed that the food offered at these restaurants was “good”, because the food was “more prepared”.

... in the first term when I actually had all my money, I went there [restaurants on Monroe Street] once or twice a week 'cause the food—it’s just more prepared. Like the Pita Pit, that’s generally pretty healthy food and it’s prepared so it’s good, and then there’s Local Boys which is rice and meat and that’s good...(male participant).

Many admitted to indulging in “bad” foods, such as macaroni and cheese and ramen noodles, because they are cheap and easy to prepare. Men identified eating at midnight and frequenting restaurants as being “bad” behaviors. Literature has identified late night snacking and frequent restaurant patronage as possible contributors to weight gain (deCastro, 2004; Levitsky et al., 2004; Lin et al., 1999; McCrory et al., 1999).

Students’ perceptions of healthy food and physical activity habits failed to reflect accurate principles of nutrition and health. Women often focused on a specific food or special eating occasion as if that one food item or event made eating healthfully impossible to achieve. For example, one talked about the fact that her sorority mandated that she attend a formal dinner every Monday night that included unhealthy options, such as a salad with the dressing already on it and dishes high in carbohydrates. Another commented on how eating a cupcake when she got done with her morning run “totally canceled it out” but that she still felt good about going for a run. A third woman understood the importance of eating a healthy diet, yet she disregarded this information. When she worked hard at the gym, she did not want all her hard work exercising to be “wasted” by eating.

I usually get really hungry after I’m done exercising. They say you have high metabolism so they encourage you to eat and they do say eating healthy food would be OK, but I just think that maybe I won’t eat tonight because I’ve exercised for the whole week and if I was healthful, I don’t
feel right eating. I feel like it’ll go to waste like all those three hours I put in exercising … (female participant).

Most students were of the opinion that staying physically active was easier to achieve than trying to eat healthfully all the time, even when they valued both. In every focus group discussion, at least one person expressed the belief that extra physical activity could compensate for bad eating habits. Many shared the same sentiments as the male participant who stated “I think I exercise…just so I can eat whatever I want”. At the same time, not everyone found value in eating healthfully and staying physically active. These participants commented that they were likely to eat whatever was readily available. They justified this by saying that they can “make up for it later”.

… a lot of times I just don’t feel like going downstairs and getting something to eat … I have a lot of stuff in my room…but it’s mostly all snacks … if I don’t have enough time to eat well and I had to eat a burrito or something that had a lot of fat or something in it, oh well, that’s the best I could do and I just try to…make up for it later … (male participant).

Students perceived Positive Influences in their Current Environment to be Supportive of Healthy Lifestyle Behaviors.

Some participants appreciated the benefits of living on their own at school. Students who lived off-campus felt that they ate better than their peers who were “tied to a meal card”. Those who lived in a house with a cook (fraternity, sorority or co-operative) may be offered fewer options on a daily basis, but found their meals to be much more appealing than campus dining hall offerings. These
students believed that they had some control over what was served, because they could talk to the cook about any issues they had with the food.

Most off-campus male participants chose to live in a fraternity or cooperative house, where meals were provided. Most off-campus female participants chose to live in an apartment, where they could cook their own food. Some of the women who lived in a dormitory found ways to cook for themselves as well. Several liked the idea of cooking when time was available and having the dining hall available when they did not have time to cook.

… I kind of decided for next year I needed like a medium step. And so I’m going to live in Hawlsey with a couple of my friends because you can… cook food there if you want to but you’ll still have Arnold right there… (female participant).

Students identified several ways that the environment at OSU encouraged them to be active. All participants agreed that Dixon Recreation Center (Dixon) was one way to encourage physical activity. Dixon is located on campus and free to all OSU students. Not all participants liked the campus based recreation center, but they all admitted that it was a great resource for encouraging activity. Another way that participants believed Oregon State influenced their physical activity was by encouraging them to walk and climb stairs, just to get around campus.

Sometimes friends and roommates were a positive influence on participants’ lifestyles. One woman regularly participates in the fit classes at Dixon because fellow classmates notice when she does not show up. Men discussed how much they enjoyed going to Dixon and playing basketball, having a wrestling match on the front lawn with
their housemates, or going to the coast and playing Frisbee all afternoon with their friends.

So what the campus does allow me is like everyone is just like open, they just do things either in the quad or on the parks—you can go play sports and people just join you…so that’s pretty cool… (male participant).

The influence of your friends can be both good and bad. While friends can encourage good eating and exercise habits, students need to know how to make their own decisions. The same friends and roommates that helped men remain physically active encouraged midnight trips to Taco Bell or raids on the house refrigerator.

Students perceived Obstacles in their Current Environment toward Healthy Lifestyle Behaviors

Many of the focus group participants’ reasons for not eating healthfully or being physically active seemed to lack legitimacy or consistency. The most common reason for not practicing healthy behaviors (as identified by participants) was a perceived lack of time. Ironically, the same students expressed appreciation for the freedom that they have now, because they are not tied down to the tightly structured schedule they maintained during their high school years. Now that they are in college, many are discovering that their schedule can fluctuate greatly from day-to-day and from one quarter to the next. This makes a specific routine difficult to establish and maintain.

…[before] I always had time and it was always … nicely structured but now it’s just all over the place…sometimes I’ll eat at 11:00 and sometimes I’ll eat at like 3:00… on Mondays and Wednesdays and Fridays I basically have class solid from like 9:00 till noon so I can’t eat until after and then
sometimes like I’ll wait for a friend to get out of class so I can eat with them. And then on Tuesday and Thursday I have a class at 10:00 and a class at 3:00 … sometimes I’m so hungry at certain times … sometimes I wait for people… (male participant).

Poor eating behavior often occurred due to the perception of having insufficient time to go and eat a proper meal and due to constraints upon the availability of options, the perception of poor quality food on campus and a failure to find ways to balance food choices to make an overall healthy diet.

Those living in the dorms believed that they did not always have the time to wait in line and eat in the cafeteria; leaving few options but to find food at a local convenience store or whatever they had stashed away in their dorm room. Students believed that the only healthy options for eating in the campus dining halls were the soups, salads and sandwiches, that eating healthy dorm food all the time became tiresome and that the fresh produce was usually unappealing and limited. Both men and women claimed that healthy options were not always available to them, because the sandwich shop closed too early in the day. This is a weak argument; it would be possible to purchase a sandwich or salad earlier in the day and save it until the student was ready to eat.

Regardless of the perceptions about dormitory food, there are indications in the literature that at least some students benefit from eating dorm food, because it provides them with a reliable supply of meals. Eating regularly throughout the day may prevent overeating late at night. Late night snacking is an activity identified to promote weight gain (Levitsky et al., 2004).
Several women identified time also as a barrier to exercise, because they wanted a block of time two-to-three hours long in which to exercise. Since their college schedule did not allow for this, they believed they had no time to exercise.

…this term’s better but in winter term…I might only be in class for three hours but they took up six hours throughout the day. There was an hour between other classes …and that doesn’t really give you time to do anything…the time thing didn’t really allow for the freedom that I needed to be able to exercise... (female participant)

Sometimes friends and roommates were a negative influence on participants’ lifestyles. One woman confessed that how she behaved was influenced by whom she was with. Many of her high school friends did not go out to eat socially, but sometimes she likes to go out and get ice cream. One of her high school friends attends OSU and she likes to go out for ice cream as well. This woman felt that her other high school friends kept her life in balance and now that they are elsewhere, she no longer has anyone to tell her not to go out for ice cream.

Like if I want to go get ice cream, I’ll call Angela and we’ll go get ice cream but if like my other friends were in town, I wouldn’t call ‘em to go get ice cream because that’s just not the way they eat... And in high school I think that it was probably better because we balanced each other out, and now they’re all gone and it’s just me and Angela… (female participant).

Several women preferred to exercise only when a specific friend was available. Women commented on how hard it was to find the motivation needed to stay active, now that a certain high school friend was no longer available to go with or stopped exercising because their “exercise buddy” no longer lives close by. These women relied on other
people to motivate them to be physically active. Men also relied on others to help them remain physically active, but they usually chose to jump in and play with whomever was available.

Healthy Lifestyles are practiced as a Function of Intrinsic Motivation and/or Lifelong Habits and Family Influences.

For a few participants, eating healthfully and exercising were just things that they did. Somehow, these students have developed a strong sense of intrinsic motivation in terms of maintaining a healthy lifestyle. It appeared that they have been practicing these behaviors for many years. One male commented: “It’s been a part of my life for a long time. I can’t imagine not doing it.” Intrinsically motivated participants did not always understand why other students struggled so much with practicing healthy behaviors.

And I think it’s pretty funny how much attention is put towards health when it is really common sense. Like people should know they need to just balance… there’s thousands of diets out there. It’s just about using your head… (male participant)

Families appeared to be a positive influence concerning intrinsic motivation. Most participants felt that the food provided at home was much better than what was available at school and have developed a new sense of appreciation for all that their parents have provided for them. Their parents often encouraged participants to be physically active as children, including simple things, such as taking them swimming or sending them outside to play. Among those participants who indicated that they had
managed to be healthy in college, many credited their families for teaching them good behaviors at a young age.

Those who appeared to be the most successful at practicing healthy lifestyles valued both healthy eating habits and staying physically active. Many commented on how being successful in one lead to success in the other. Women focused on the sense of accomplishment that they felt when both were achieved. Men focused on how much better they could perform in sports when they ate healthfully. Several men and women commented that they believed that their bodies functioned better when they were physically active.

When it comes to motivation to exercise, the most often identified factor was enjoyment. Similar to findings reported in other studies, these students linked motivation to enjoyment. One must either enjoy the activity or enjoy how the activity makes you feel (Brown, 2005; Henry et al., 2006; Hildebrand and Johnson, 2001; Keating et al., 2005; Kilpatrick et al., 2005; Kraemer et al., 2001; Leslie et al, 1999; Nahas et al., 2003; Simmons et al., 2003; Turner et al., 1997). Relieving stress and physical ailments were also occasionally mentioned as motivators.

… I like to run on a regular basis. And it’s kind of a way not just to exercise… but kind of get away, get some fresh air, think about things that are going on in your life, get away from homework, just kind of a nice “out,”…a way to burn some steam or…think about a midterm coming up but not actually having to sit there and stare at the paper for a while…(male participant).
Participants gave many examples that show how important enjoyment is to keeping you motivated. Finding it difficult to carry on a conversation and exercise, one man liked to work out alone – just “put on my headphones and get it done”. Others enjoyed exercise when it included their friends. Most men enjoyed the competitiveness of games at Dixon. One woman enjoyed going for a walk with her mom and swimming. Another enjoyed more vigorous outdoor activities, such as hiking. Women emphasized the importance of choosing an activity that does not feel like exercise.

… it’s important to me and easier for me if I find exercise that you don’t really feel is exercise … I just think it’s important to find things that you actually like doing that don’t necessarily fit the stereotype of going to the gym and running or whatever…(female participant).

Not every one in the focus group discussions was intrinsically motivated to exercise. Several women said that they did not exercise regularly because they lived too far away from Dixon Recreation Center. One of these women lived in a dormitory on the west side of campus. While Dixon is a nice facility, proximity to Dixon was not identified as a problem for those who were intrinsically motivated to exercise. In fact, many of the women who identified themselves as being physically active only used Dixon in inclement weather or late at night.

Some Students Struggle with the Life Skills, Experience and Discipline Needed to Manage their Behaviors

The focus group discussions presented evidence that suggest students struggle with a lack of skills necessary for living successfully on their own. Many had limited
experience with making decisions for themselves, as well as planning and preparing meals and in managing their time and money prior to arriving at OSU.

Participants said that their parents provided meals for them throughout their high school years; most had very little control over what they ate as teenagers. Even if meals were not prepared for them, pre-college choices were limited by what was available at home. After coming to OSU, these participants developed a new appreciation for their parents. Not only were home cooked meals free, they also tasted better than dorm food.

Having parents provide for their basic needs gave these students the freedom to concentrate on their high school studies and other interests, but did not help them to develop healthy lifestyle decision making skills. College is an environment where students need to make their own decisions. When they are not prepared for this task, temptations can easily get in the way of making good choices. Several participants commented on how important it is for college students to decide things for themselves.

And I think that’s challenging because also in college it’s obvious, unless you make that decision yourself, that there’s drinking and there’s partying and…it’s up to you when you want to eat and how much you want to eat, which is…I’ve witnessed in some people, especially in the college atmosphere, it’s difficult for them to monitor (male participant).

Students believed that they were forced to choose between time and money. Not only were choices limited by how much money you had, they were also limited by time. One woman noted that she eats better now than she did winter term because she has more down time, but then added, “I don’t eat out because I can’t afford it anymore.”
Another discussed the importance of loving nutritious food and how much she enjoyed making stir-fry, but finding it too difficult. Later in the discussion she admitted that she usually ate out because it took so long to cut up the vegetables. This reinforces other research suggesting that people do not eat healthy options that they enjoy when the preparation is perceived to be too time-consuming or difficult (Eldridge and Murcott, 2000).

… I like making stir-fry … find a variety of foods that you like and just mix them around. So I think there’s a lot of options that you can have with eating healthy … if I make stir-fry, that’s like once a month because that takes a long time to cut everything up… for lunch, I usually pick up something on the way here… I come out early to find a parking spot and then sit in my car, eat, and look over my school stuff… Sometimes I’ll make something at night but…it’s kind of rare … (female participant).

Some participants find it hard to get out and move without someone giving them a good reason to do so and the maturity to realize the long term benefits of their behaviors. One obese female participant did not value eating right and exercising because she could not see any benefits to doing so. This was especially true for exercise. She pointed out that while heavy individuals may value physical activity, often they do not exercise because it is painful to do so. She focused only on the short term, negative aspects faced when establishing an exercise routine.

…It brings me down when I put all this work into exercising and absolutely nothing happens…I might be motivated but… I get sick to my stomach, I get dizzy, I feel like I’m going to pass out… I did it for like… two weeks straight… I went and worked out for maybe five hours every day…we had fun… But nothing happened—I didn’t lose weight, didn’t feel better… (female participant).
While they may acknowledge that their lifestyles were not ideal, few participants had developed the maturity to see that their current habits could be shaping lifetime behaviors. For most, exercise is primarily about how they look. They expressed the belief that, because they do not have any concerns about their body, they are allowing other activities to take precedence. These participants believe that school work and friends should take a higher priority than their own physical well-being. As a result, making healthy lifestyle choices was often not their first priority.

… I went and I started to work out, things like that, and that was great. And then I just got into, “Oh, I don’t have time for it. I have to study or I want to go out or go hang out with people. I look fine, whatever, you know, not too bad.” (female participant).

Some chose to be physically active for extrinsic reasons. Women chose to exercise more in the warmer months, when they wear revealing clothing. In the winter they would be more lax, because no one would notice a small weight gain. The driving motivation was appearance; health was not mentioned as a concern for these participants. One man stayed fit because he used to be the captain of his high school football team and sometimes people recognized him.

I was captain of the team, I had the highest lifts at our school, and…those are sources of pride. And you don’t really lose that so when I went to college, I wanted to kind of maintain that and that’s why I still work out and that’s why I still remain active…I care about that and it’s part of my character. People recognize me as, you know, the person and if they knew me from high school I was the football player so…I don’t want to lose that…(male participant)
Students believed that healthy options were more expensive and they were not always motivated to spend that extra money. Those desiring to eat better needed to plan and budget accordingly. Some comments indicate that not all participants had a lot of cooking skills, because what they identified as “healthier options” consisted of such things as Healthy Choice frozen dinners. Health was also not a concern for these participants. Similar to the literature, they were motivated by taste, convenience, ease of preparation and cost (Horacek and Betts, 1998).

…you notice how much more expensive healthier foods are than just regular… if you’re buying frozen dinners, the Healthy Choice are twice as much as like the Budget Gourmets… and as far as like Mac’n’Cheese or Cup o’ Noodles … we tend to buy a lot because they’re really inexpensive and they taste pretty dang good… that makes it really hard unless you’re really determined and you’re actually budgeting for… the healthy eating habits… (male participant)

For many of these focus group participants, the reward for unhealthy behaviors with your friends outweighs the consequences of non-healthy living. This was especially true for those who could not see any immediate consequences from their actions. While they knew a steady diet of restaurant food was unhealthy and expensive, sometimes the social benefits outweighed the nutritional sacrifice.

…a lot of the guys have their vehicles and if you have the money, you’ll go to Jack-in-the-Box in the middle of the night or…Taco Bell is open until 1:00… it’s good socially because it’s always fun to spend time together, but then again you’re finding yourself going kind of on a regular basis with a bunch of people and you’re eating really unhealthy… (male participant)
Coming to College has Changed Students’ Support System, Relevant to Healthy Living

High school days were highly structured for most participants; a strong support system made up of parents, teachers, coaches and/or a boss told them where to go, what to do and when to do it. For many, the discussion revealed that this tight-scheduled lifestyle did not allow them to make many decisions on their own. These pre-college support systems are no longer a daily presence in most college students’ lives. College students need to decide for themselves how to effectively use the resources available to them (such as time and money). The transition from pre-college “structured life” to college “independent living” may be too great or too sudden for some students to handle.

Every focus group discussion included comments on how participants were more active in high school, because they played sports with their friends. They talked about high school sports as if participation was not optional (it was just part of their daily routine). Now, supportive high school friends go to different schools, college coaches and teachers are not encouraging sports participation and other commitments are getting in the way. It is possible that this explains why several studies show a drop in the physical activity level of students from high school into college (Driskell et al., 2005; Huang et al., 2003; Lowry et al, 2000; Sax, 1997).

Even though parents and coaches are no longer present on a daily basis, they are still an important part of college students’ support system. Students often draw on the values that their pre-college support system instilled in them. In many cases, these values were acquired at a young age. It was apparent from the focus group discussions that
parents, teachers, coaches and high school friends all had an influence on what behaviors students chose to identify with in college.

How successful college students were in practicing healthy lifestyle behaviors may be influenced by other individuals in their environment. There was evidence that college friends and roommates were becoming a very strong component of students’ support system as the year progressed. Most off-campus apartment dwellers noticed that their eating habits and those of their roommates started converging over the course of the year. One male started running, just so that he could run with his friends. Many of those who stayed physically active did so because they surrounded themselves with others who were also physically active.

Friends and roommates were not the only component of the college support system that was mentioned. One man found that his motivation for staying active at OSU was the ROTC. Exercise is an activity that he started participating in after arriving at college, because his new support system told him to “get out and move”. The information provided in HHS 241 was identified as being supportive by a few participants.

… When I first went into the course, I was thinking, “Oh, this is going to be simple. They’re just going to tell you the basic overview… they weren’t actually talking about that—they were talking more on a personal level like: We know this is college. We’ve been there too and we know these are things that are going to come up and there are certain ways that we’ve found helpful. And I found that a lot more refreshing than the normal like health in high school was… We’ve seen it happen. We know the troubles… We know drinking is a problem here. Here are some ways to try to solve it… we know that you’re going to have trouble finding something to do. Here are hundreds of ways to solve it—certainly there’s going to be one way that you’re going to enjoy. (male participant)
Some male participants were very active in high school team sports, but not good enough to play at a college level. It appeared that these men were motivated to move, but did not have the maturity and discipline needed to maintain the level of physical activity that they were used to, now that they were on their own. Apparently, these men could not figure out how to be physically active without the support of a coach.

…it’s just been like part of my life for a long time…it’s weird to be without it. Like I ran track and there’s no track team here, and like I played soccer but I’m not good enough to play here, and then I played baseball and I’m not good enough to play here either… and now it’s spring …for like four years at this time, you know, I’d be like practicing or playing a sport like organized, and now it’s just like I’m here in college and it’s weird… (male participant).

Students are Surprised at the Difficulty in Managing Healthy Behaviors and Attempt to Develop Strategies to Manage their Behavior and Weight.

Several students possessed the maturity to realize that their behaviors and actions were now their responsibility. No longer was anyone going to make them do it or do it for them and it was not just going to happen. If they wanted to maintain a healthy lifestyle it was up to them to get the job done. For some, they were attempting to devise strategies that would motivate them to adhere to healthy lifestyle habits.

…I think once you get in college is just a realization that if you don’t start somewhere, it gets harder and harder as you get older…to keep exercising and eating right…(male participant).

Some participants knew whether or not they had gained weight since the start of school. Most of the women who gained weight during college were taken off-guard by
the impact that their new lifestyle had on their bodies. These women discussed plans to improve their lifestyle habits over the summer and be more prepared for next year.

This summer is going to be a really, really good opportunity… I’m going to work out every single day… I feel disgusting the way I am just from how I’ve been eating … it’s just going to be so much nicer once I get back in … a normal environment and then really concentrate on … planning out what I’m going to do next year… so that I don’t just go in blindly again (female participant).

Each group mentioned at least one strategy for making healthy lifestyle choices. Men kept things simple. Those concerned about eating healthy foods kept mental notes concerning their food consumption. When their eating habits become less-than-ideal for a few days, they would make an effort to choose healthier options. They did not get upset with themselves for eating poorly. Instead they chose to just move on to the next meal. One man commented on a specific strategy. He lived in an apartment and his strategy was to go to the grocery store only on a full stomach.

Females discussed numerous strategies for managing healthy eating. One strategy was to avoid having pop in her house. She considers it a treat and only drinks it away from home. Another woman started treating exercise like a class that she must attend three days per week. Other strategies included counting kilocalories, living somewhere that allows her to cook her own food and looking back at what has changed from high school.
CONCLUSION

The purpose of this research was to determine weight stability and to explore the influences upon eating and physical activity habits among undergraduate students attending Oregon State University (OSU) during the 2004-2005 academic school year. The research questions addressed included: 1) What is the weight stability of college students during their initial college years? 2) How does college life influence food choices and consumption patterns? 3) How does college life influence physical activity and exercise patterns? And 4) Do “pre-college” behaviors and influences have an impact on eating and exercise behaviors in college?

Similar to other studies concerning weight stability, only 32% of the students who participated in Phase One gained more than 4.9 pounds (Anderson et al., 2003; Graham and Jones, 2002; Hodge et al., 1993; Levitsky et al., 2004). Several other factors make this study unique from what was found in the literature. This study utilized a larger sample size and anthropometric measurements were measured by the researchers. Some of the other studies obtained anthropometric data from other sources. In addition, some studies collected weight, but not height data. This study included a very large percentage of male participants (58%) for the Phase One weight stability component. Few of the other published studies using measured weights had this large of population of males and also provides data to indicate that both males and females are inclined to gain weights in college. It revealed similar weight stability patterns among both genders that was not previously available.
While quantitative data addressed the question concerning weight stability, all other questions were answered from the focus group discussion analysis. The goal of this research was to explore the transition of behaviors among a small group of undergraduate students from their pre-college home life to Oregon State University with respect to their food consumption patterns and physical activity behaviors.

Focus group participants acknowledged that their parents provided for them throughout their high school days. This is the first time that many of them have had total control over what, when and how much they eat. Much of the focus group discussions centered on how many choices (both good and bad) are available now, and the extent to which they are successful in choosing healthy foods. While some are embracing this freedom with great enthusiasm, others are overwhelmed by all the choices; most are doing what is easiest and most appealing. With a lack of meal planning and preparation skills they are challenged to truly apply principles of healthy eating on a daily basis.

Many participants have not fully developed the life skills and maturity necessary to successfully live on their own and many of the support systems that they relied on in the past are no longer readily available. This combination made them vulnerable toward making bad choices in the face of so many options. Friends are now the primary support system and friends are both a positive and negative influence concerning food choices and consumption patterns. A few have realized that with freedom comes responsibility and that they are now in charge of their own decisions. Those who appear to be most successful are the ones who were intrinsically motivated to live healthfully. Somehow, they have found the discipline needed to establish good habits and routines.
The focus group participants identified many ways that OSU supports a physically active lifestyle. While active participants had no problem finding ways to stay active, most participants allowed the lack of structure brought on by college to decrease their physical activity level. Some students wanted to be more active, but lacked the maturity and skills needed to do so without the aid of a coach. Other inactive participants welcomed the change to a more sedentary lifestyle. Their priorities were changing; school work and other obligations were now taking precedence over exercise. Health was not a concern; whether or not they were active was determined on their level of satisfaction with their appearance. Those who appeared to be maintaining regular physical activity were the students who realized a long term benefit to stay active and that establishing a healthy lifestyle will not get easier as they get older.

Physically active participants did not identify any obstacles to being active. Those who were physically inactive often justified inactivity by saying that they did not have convenient access to exercise facilities, they did not have enough time or they had no one to exercise with. They appeared to struggle with how to schedule their time. Intrinsic motivation appeared to be the key to success, which was lacking in those that did not exercise routinely. It is possible that they have not developed the level of maturity needed to understand that being physically active is something that you do for yourself.

Parents, teachers, coaches and high school friends were influential in establishing the habits and routines practiced after starting college. Having parents that encouraged regular physical activity at a young age may have given some focus group participants
that habit that keeps them active in college. Working with a coach gave teens’ physical activity structure and playing with friends on a team lead to the enjoyment of sports. At the same time, it did not prepare students for dealing with life beyond organized high school team sports. The loss of both teammates and a coach was difficult for some to deal with. Men had a harder time with the loss of a coach; women had a harder time with the absence of their friends and teammates. In order to achieve healthy lifestyle habits during their college years, these students must find a way to be motivated to succeed, without the presence of their pre-college support systems. Strategies that foster peer coaching of healthy lifestyles may be needed.

Most students found physical activity easier to accomplish than healthy eating habits. Perhaps this was because their pre-college food choices were limited by what was offered by their parents, but they were allowed to choose what type of activity they wanted to participate in. Encouragement from friends often influenced the type and intensity of pre-college activities.

Implications and Future Directions

Phase One of this study revealed that one-third of participants gained at least 5.0 pounds during the fall term of 2004. Focus group discussions found the influences upon their eating and exercise habits to be diverse. Time, money, resources and enjoyment all factored into why the focus group participants made the choices that they did. The support of friends and roommates influenced the choices that students made, but those who were most successful relied on their own intrinsic motivation to make positive
lifestyle choices. The participants identified enjoyment as the most highly valued component of intrinsic motivation.

This was a preliminary study which revealed some outcomes that need further exploration. First, a clearer understanding of how students identify food as healthy or not, is needed. While they appeared to have knowledge concerning healthy eating behaviors, their application of this knowledge and adherence to recommendations is inconsistent at best. Students often labeled entire categories of food as “good” or “bad” with a lack of understanding how many foods can fit into a healthy balance in caloric intake with energy expenditure. Students also lacked the skills necessary to prepare and/or plan for choosing healthy diets on limited funds or from the choices available with meal cards. Finding ways to communicate these concepts more clearly to students would be useful.

In addition, research is needed to explore how to encourage intrinsic motivation to eat healthier and exercise among college students. Motivated students admitted that they were at their best when they ate right and were physically active. Most focus group participants believed that it was easier to be physically active than to eat healthfully in college. Physically active participants identified enjoyment most often as the reason they chose an activity, but physical activity was not described as being enjoyable by all participants. Future research should look for activities that inactive students enjoy doing, and use this information to develop programs for inactive students. After an inactive student finds a way to enjoy physical activity, promotion of a healthy diet would augment the beneficial aspects of staying active.
Another important implication is the need to develop support systems or peer reinforcement for managing food intake and exercise. College students have lost most of their pre-college support system and the influence of their new peers can be both positive and negative. Campus dining halls may want to determine the extent to which their options may be deterrents to the perception of choosing healthy foods for college students. If the perceptions about food choices are inaccurate then students need a better understanding of the parameters of choosing a healthy diet, based on generally accepted nutritional standards. One possibility would be to have Registered Dietitians available in the campus dining halls during dining hours, as a resource to help students make good choices. Several students commented that they chose not to go exercise so that they could do something with their friends instead. Searching for ways to encourage friends to exercise together could increase activity levels.

Strategies to help students find ways to manage food intake and build exercise into their routines or schedules may be needed. The most common reason for not exercising was that students perceived that their studies, obligations and friends needed to take priority over personal health. Students may need to be given more opportunity for learning time management as a program offered through the student support services that are available. Innovative multi-tasking, that incorporates exercise into other activities, may be useful. Health clubs that provide televisions and headphone jacks in front of the cardio machines foster exercise among those that are not intrinsically motivated. If inactive students can do something else the same time, they may be willing to try exercising.
Limitations

While the demographic data indicates that the population was representative of the whole of OSU, the study was limited to one university. This study was also limited since the focus groups were very small and homogeneous. The five groups ranged in size from 2 – 5 people and 19 of the 20 participants were Caucasian and resided in the Pacific Northwest. The sample is not reflective of college students across the country. Participants were self-selected from the population and this bias may have produced different results.
BIBLIOGRAPHY


APPENDICES
APPENDIX A: Informed Consent Phase One

Human Development & Family Sciences  
Family Policy Program  
202 Bates Family Study Center  
Corvallis OR 97331-5151 USA  
Phone: 541-737-2035 • Fax: 541-737-5579

Project Title: Lifestyle Changes and Adaptations in Food Consumption and Activity Patterns Among College Students  
Principal Investigators: Deana Grobe, HDFS, Family Policy Program; Mary Cluskey, NFM  
Research Staff: Julie Jensen, NFM Graduate Student

PURPOSE

This is a research study. The overall purpose of this research study is to understand how college influences health and food choice behaviors, and ultimate lifestyle habits. The data we are collecting today will be used to establish baseline height, weight and demographic information on a sample of college students, and will be used to design a qualitative study to be conducted later in the academic year. The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read the form carefully. You may ask any questions about the research, what you will be asked to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all of your questions have been answered, you can decide if you want to be in this study or not. This process is called “informed consent”. You will be given a copy of this form for your records.

We are inviting you to participate in this research study because you are part of a sample of students enrolled in HHS 241.

PROCEDURES

If you agree to participate, your involvement will last for approximately 5 minutes. The following procedures are involved in this study. You will be asked to fill out a short survey questionnaire, and get your height and weight measured by one of the researchers.

RISKS and BENEFITS

We do not anticipate any risks as a result of participating in this study. There may be no personal benefit for participating in this study.


CONFIDENTIALITY

Records of participation in this research project will be kept confidential to the extent permitted by law. However, federal government regulatory agencies and the Oregon State University Institutional Review Board (a committee that reviews and approves research studies involving human subjects) may inspect and copy records pertaining to this research. It is possible that these records could contain information that personally identifies you. In the event of any report or publication from this study, your identity will not be disclosed. Results will be reported in a summarized manner in such a way that you cannot be identified.

VOLUNTARY PARTICIPATION

Taking part in this research study is voluntary. You may choose not to take part at all. If you agree to participate in this study, you may stop participating at any time. You may choose to skip any questions on the questionnaire you prefer not to answer. If you decide not to take part, or if you stop participating at any time, your decision will not result in any penalty or loss of benefits to which you may otherwise be entitled. Any data collected prior to withdrawal will not be included in the study.

QUESTIONS

Questions are encouraged. If you have any questions about this research project, please contact Deana Grobe, 541.737.5373, deana.grobe@oregonstate.edu. If you have any questions about your rights as a participant, please contact the Oregon State University Institutional Review Board (IRB) Human Protections Administrator, at (541) 737-3437 or by email at IRB@oregonstate.edu.

Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Signature of Participant ___________________________ Date ________________

Participant’s Name (printed) ___________________________

RESEARCHER STATEMENT

I have discussed the above points with the participant or, where appropriate, with the participant’s legally authorized representative, using a translator when necessary. It is my opinion that the participant understands the risks, benefits, and procedures involved with participation in this research study.

Signature of Researcher ___________________________ Date ________________
APPENDIX B – Informed Consent Phase Two

Nutrition and Food Management
College of Health and Human Sciences
200 Milam Hall
Corvallis OR 97331-5103 USA

Project Title: Focus Groups on Lifestyle Changes and Adaptations in Food Consumption and Activity Patterns Among College Students
Principal Investigators: Mary Cluskey, NFM; Deana Grobe, HDFS, Family Policy Program
Research Staff: Julie Jensen, NFM Graduate Student

PURPOSE
This is a research study. The overall goal of this research study is to understand how college life has had an impact on healthy lifestyles and food choice behaviors. The purpose of this consent form is to give you the information you will need to help you decide whether to be in the study or not. Please read the form carefully. You may ask any questions about the research, what you will be asked to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all of your questions have been answered, you can decide if you want to be in this study or not. This process is called “informed consent”. You will be given a copy of this form for your records.

PROCEDURES
If you agree to participate, your involvement will last for approximately 90 minutes to 2 hours. Your involvement in this project will consist of participating in a focus group about how college life has had an impact on healthy lifestyles and food choice behaviors. The conversation will be tape-recorded to ensure that your comments are accurately described. The tapes will be destroyed after their contents have been analyzed.

RISKS and BENEFITS
We do not anticipate any risks as a result of participating in this study. There may be no personal benefit to you for participating in this study.

COMPENSATION
You will be compensated for participating in this research project. You will be given an incentive of $12 in campus food coupons for your participation in the study after attending the focus group session. You need to be present at the focus group session in order to receive full payment.

CONFIDENTIALITY
Records of participation in this research project will be kept confidential to the extent permitted by law. However, federal government regulatory agencies and the Oregon State University Institutional Review Board (a committee that reviews and approves research studies involving human subjects) may inspect and copy records pertaining to this
research. It is possible that these records could contain information that personally identifies you. In the event of any report or publication from this study, your identity will not be disclosed. Results will be reported in a summarized manner in such a way that you cannot be identified.

**VOLUNTARY PARTICIPATION**

Taking part in this research study is voluntary. You may choose not to take part at all. If you agree to participate in this study, you may stop participating at any time. Any data collected prior to withdrawal will not be included in the study. Although you may not be able to verbally comment on every question asked during the interview, please try to participate as much as possible. A blank piece of paper and pencil will be provided for you, in case there is any additional information that you wish to share with the researchers. If you leave this paper in the room upon conclusion of the study, information on it will be included in the data collected for this research.

**QUESTIONS**

Questions are encouraged. If you have any questions about this research project, please contact Deana Grobe, 541.737.5373, deana.grobe@oregonstate.edu. If you have any questions about your rights as a participant, please contact the Oregon State University Institutional Review Board (IRB) Human Protections Administrator, at (541) 737-3437 or by email at IRB@oregonstate.edu.

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Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

______________________________  __________________
Signature of Participant        Date

______________________________
Participant’s Name (printed)

**RESEARCHER STATEMENT**

I have discussed the above points with the participant or, where appropriate, with the participant’s legally authorized representative, using a translator when necessary. It is my opinion that the participant understands the risks, benefits, and procedures involved with participation in this research study.

______________________________  __________________
Signature of Researcher        Date
APPENDIX C - Survey Instrument

Student Identification Number

First, we would like to measure your weight and height and ask you a couple of questions regarding these measurements.

1. Weight and Height Measurements
   
   Your weight in pounds ____________
   
   Your height in inches ____________

2. How would you describe yourself?
   - Very underweight
   - Slightly underweight
   - About the right weight
   - Slightly overweight
   - Very overweight
   - No answer

3. Which of the following are you trying to do?
   - Reduce weight
   - Gain weight
   - Stay the same weight
   - I am not trying to do anything about my weight
   - No answer

Your responses to the following questions are important for our statistical analysis. In our report, information will be summarized for all respondents; never any one person’s response.

4. Are you:
   - Female
   - Male

4. What is your age? ________

5. Year in college:
   - Freshman
   - Sophomore
   - Junior
   - Senior

6. Major field of study: _____________________________
   (such as Agricultural Sciences, Business, Education, Engineering, Forestry, Health and Human Sciences, Liberal Arts, Science, Pharmacy, Oceanic and Atmospheric Sciences, Undecided)
7. Where do you currently live? (check one)
   - Residence hall/campus dorm
   - Greek house
   - Off-campus housing or apartment
   - Live with parents

8. What type of community did you grow up in?
   - Farm or rural area
   - Small town (less than 10,000)
   - Small city (10,000 to 100,000)
   - Large city or suburbs (over 100,000)
   - Don’t know

9. Which of the following best describes the structure of your family while growing up?
   - Two parent family
   - Single mother family
   - Single father family
   - Other (please specify): ___________________________

10. While you were growing up did:
    - Both parents work outside the home
    - Only your father worked outside the home
    - Only your mother worked outside the home
    - Other (please specify): ___________________________

11. Which best describes your racial/ethnic identity? (Please check all that apply)
    - American Indian or Alaskan Native
    - Asian or Pacific Islander
    - Black, not of Hispanic Origin
    - Hispanic
    - White, not of Hispanic Origin
    - If none of the above choices apply to you, please use your own description:
      __________________________________________________________
    - Decline to respond

Thank you for your participation. We will be doing a follow-up study later this term and next spring, may we contact you to see if you are interested in participating?

   - Yes  
   - No

What is the best way we might most easily reach you? (For example: email address, phone number, address) ___________________________

Thanks again!
APPENDIX D – Sample Email/Phone Script:

Hello,

My name is Julie Jensen. I am an OSU graduate student in the department of Nutrition and Food Management who is working on a research project with Dr. Mary Cluskey and Dr. Deana Grobe. During the second and tenth week of Fall Quarter, you participated in our project, by allowing us to record your weight and height and by filling out a short survey, during your HHS 241 lab. On that survey, you indicated that you would be interested in a follow-up study later in the school year and that this was the best way to contact you.

We would like to invite you to participate in a focus group on healthy lifestyle and food choice behaviors. The discussion is expected to last between 90 minutes and 2 hours. You will be compensated for your time with $12 worth of campus food coupons. Your name will not be linked to any information we collect; all information you provide will be kept in the strictest confidence.

If reached via telephone: Would you like to participate?

No: Thank you for your time. The help you have given us has been very beneficial.

Yes: Thank you for your help. Please provide me with a name and address, so that I can send you an invitation. Either a mailing or email address will do. I will give you a reminder call the day before your focus group is to meet.

If reached via email: Please send a reply to: Jensenju@onid.orst.edu, indicating whether or not you are interested in participating. If you are interested, please include a phone number so that I can give you a reminder call the day before your focus group is to meet.
APPENDIX E – Focus Group Moderator’s Script

Healthy Lifestyles Focus Group

Introduction and Informed Consent Procedures:

A greeter will welcome participants. Participants will meet in small groups with the Research Assistant to (a) review the main elements of the informed consent document, (b) discuss any questions or concerns, and (c) obtain participants’ signatures of consent to participate in the focus groups. Name tents with participants’ first names will be created as well.

Refreshments will be made available to participants. When it is time for the focus group to begin, participants will be directed to sit at a table, facing one another with their name tents in front of them.

The Pause and Probe Techniques:

The five-second pause is often used after a participant comment. This short pause often prompts additional points of view or agreement with the previously mentioned statement.

The probe, or request for additional information, helps to illuminate vague comments. Examples of probes are as follows:

- Would you explain further?
- Would you give an example of what you mean?
- Would you say more?
- Tell us more.
- Is there anything else?
- Please describe what you mean.
- I am not sure I understand what you mean.
- Etc.

Welcome and Introductions:

Hello and welcome! I’d like to thank you for taking time out of your busy lives to join us this evening. We very much appreciate your willingness to share your insights with us. As you know, the purpose of this focus group is to discuss your nutrition and exercise experiences both here at Oregon State University and at your home prior to attending university.
My name is Lori McGraw and I will be your moderator for this evening. Julie Jensen is the Graduate Research Assistant on this project. She will be taking notes to make sure that we get as much information as possible. Our work here, today, will be used for Julie’s masters thesis.

Before we begin, I’d like to provide you with guidelines for our discussion.

- First, we are audio taping our conversation so that we don’t miss any of your important comments. This is necessary because we can’t write everything down fast enough to remember it all. To maintain confidentiality, these tape recordings will be shared only with researchers and with the person who transcribes the tapes. In order to maintain a high level of confidentiality, we will use only first names tonight.

- While those of us collecting your information will keep your comments confidential, we can’t speak for those participating in the focus group. We do urge everyone, however, to respect the confidentiality of others by not revealing who participated in the group and by not telling anyone else what is said in the group.

- As you can see, we each have name tents. These tents help me remember names, but they can also help you. If you want to follow-up on something that someone has said—if you want to agree or disagree—feel free to do that. You do not have to respond to me all the time. I want to encourage you to have a conversation with one another about these questions.

- Also, it is important for you to remember that there are no right or wrong answers. We expect that there will be differing points of view. Please feel free to share your point of view even if it differs from what others have said.

- I am here to ask questions, to listen, and to ensure that everyone has a chance to share. We’re interested in hearing from each of you.
Do you have any questions?

**First name issue. Try-not-to-talk-at-the-same-time issue.**

**Questions:**

Let’s start with a definition of a “healthy lifestyle.” What do you think a healthy lifestyle? (10 minutes)

Now, let’s think in particular about the nutrition and exercise components of a healthy lifestyle. Think about your present experiences.

What components of a healthy lifestyle do you value?

- ✓ Nutrition (both what you eat and drink)
- ✓ Exercise

Which of these components do you value more? For example, it may be important to you to exercise daily but it may not be important to you to choose the healthiest food on a regular basis.

Provide an example that illustrates your values.

How does your present environment here at Oregon State University (a) support and/or (b) hinder your lifestyle values.

- Probes: OSU food service choices, restaurants, roommate food preferences, socializing, time pressures, class schedules.

When a roadblock exists in meeting your food and exercise values, here at OSU, what do you do?

**FLIP TAPE**

Now, think back to when you lived at home with your parents or other adult guardians.
What components of a healthy lifestyle did you value then?

✓ Nutrition
✓ Exercise

Which of these components did you value more? Provide an example.

How did this past environment (a) support and/or (b) hinder your lifestyle values?

   Probes: family meal patterns, involvement in sports, different food preferences from your family.

When a roadblock existed in meeting your food and exercise values, what did you do back then?

**Conclusion:**

Is there anything else that we haven’t talked about that you think should be included?

Thank you so much for helping us better understand your experiences. Your information will be used to improve the healthy lifestyle environment here at Oregon State University.
APPENDIX F – Perceptions of “good” and “bad” Foods

Good foods:
1. Anything homemade.
2. House food
3. Steamed vegetables
4. Organic fruit drinks
5. Egg whites vs. egg yolks
6. Salads and green vegetables
7. Fruit
8. Chicken
9. Good rice
10. Dorm food: Soup, salad bar and sandwiches only
11. Skipping meals after exercising
12. Healthy Choice frozen dinners
13. Bottled Water
14. Dutch Brother’s coffee drinks
15. Restaurant food that’s “prepared” (men who gained)
   i. American Dream Pizza
   ii. Local Boys
   iii. Big Town Hero
   iv. Qudoba
   v. Pita Pit

Bad foods:
1. Pop
2. Chocolate
3. Top Ramen Noodles
4. Greasy potatoes
5. Hamburgers
6. Chocolate chip cookies
7. Anything ‘premade’
8. Teriyaki sauce
9. Soup-in-hand
10. Burritos
11. Nachos
12. Pop tarts
13. Microwavable things
14. Anything with a high fat/cholesterol count on nutrition label
15. Pie
16. Macaroni and cheese
17. Cup-o-noodles
18. Budget Gourmet frozen dinners
19. French Fries
20. Hot dogs
21. Pizza
22. Greasy Pork Chops
23. Fried Chicken
24. Corned beef and cabbage
25. Home made bread
26. Biscuits and gravy
27. Salad Dressing
28. Noodles – carbs
29. Ice cream
30. Hamburger Helper
31. Hot Pockets
32. Dorm food:
   a. Large servings of chicken parmesan at McNary
   b. Stir fry with 10 gallons of oil on it
   c. Desserts – your best bet for taste!
33. Fraternity food:
   a. Chips, cheese and salsa at midnight
   b. Nachos
   c. Cheese quesadilla
34. Fast Food and restaurants:
   a. Taco Bell
      i. grilled stuffed burrito
   b. Carl’s Jr.
   c. Wendy’s
   d. McDonalds
      i. Egg McMuffins
   e. Dennys
      i. Breakfast Sampler Platter at Denny’s
         1. Sausage, Bacon, Pancakes, Hash browns, Eggs, Ham & Cheese
   f. $1.50 value meals
   g. Dairy Queen
   h. Applebees
   i. Baja Fresh