THE RESPONSE OF AMERICAN COLLEGES AND UNIVERSITIES TO THE NATIONAL COLLEGIATE ATHLETIC ASSOCIATION’S DEREGULATION OF FEEDING STUDENT ATHLETES IN RELATION TO NUTRITION SUPPORT

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A thesis submitted to the Kent State University College of Education, Health, and Human Services in partial fulfillment of the requirements for the Degree of Master of Science

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The purpose of this study was to gather information regarding the response of NCAA affiliated Division I and Division II colleges and universities to the deregulation of feeding student athletes. Due to the descriptive nature of the study no hypotheses were established.

These results coincide with the research of the CPSDA (Markey, 2015) that examined fueling stations of schools in the Power 5 conferences (Big 10, Big 12, SEC, ACC, and PAC-12). This research also looked at smaller Division I and Division II colleges and universities and discovered that while they are not spending the money to develop the extensive systems that the Power 5 institutions, they are still developing fueling stations that serve hundreds of student athletes a variety of nutrient and energy rich foods while still creating jobs, but on a smaller budget.
ACKNOWLEDGMENTS

This research would have not been possible were it not for the aid of Dr. Chuck Stiggins at the Collegiate Strength and Conditioning Coaches Association and Sarah Markey at the Collegiate and Professional Sports Dietitians Association. Their contributions to reaching potential participants were invaluable. Without the late night assistance from Raelle Snails in gathering contact information this research also would not have been possible. The members of the thesis committee, Dr. Karen Gordon and Jamie Matthews, encouraged thought processes in the development of this research that I would not been able to accomplish alone. Thank you Dr. Amy Miracle for being the driving force behind the creation of interest in this topic for me, for spring breaks sacrificed, and for being able to tell exactly the inspiration I needed in order to accomplish my goals.
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CHAPTER I

INTRODUCTION

The increased physical activity of athletes requires an increase of energy intake from food (American Dietetic Association, Dietitians of Canada, & American College of Sports Medicine, 2009; Burke, 2001; Loucks, Kiens, & Wright, 2011). The intensity and duration of physical activity can necessitate increases ranging from more than just the energy needs of sedentary individuals to as much as two to four times as much as a sedentary individual (Loucks, et al., 2011). While training for the 2012 London Olympics, U.S. swimmer Michael Phelps reportedly consumed upwards of 12,000 calories per day (Scott, 2012). While an athlete may need more than two to four times as much energy from food as a sedentary individual, the distribution of the energy over the three energy supplying nutrients, protein, carbohydrates, and fat, remains the same (IOM, 2005, Chapter 11). One of the largest specific populations that exhibit an increased estimated energy requirement and are at risk for inadequate energy intake are college and university athletes in the United States. Total energy intakes of student athletes, especially from carbohydrates, fall well below estimated recommendations, on average. Even using light to moderate physical activity factors (Hinton et al., 2004) or minimum recommendations for carbohydrates (Shriver, Betts, & Wollenberg, 2013) to calculate the needs of student athletes, both males and females receive significantly fewer grams of carbohydrates than their estimated needs. Lack of knowledge or limited access to nutrient dense foods attributes to the increased risk of inadequate energy intake (Cole, Salvaterra, Davis, Borja, Powell, Dubbs, et al., 2005; Dunn, Turner, & Denny, 2007)
In August of 1991, the NCAA modified rules to standardize what sustenance affiliated colleges and universities could provide to their student athletes in order to limit any advantages that more highly funded programs may receive. These regulations applied to all student athletes, which as of August 2014, between the three divisions defined by the National Collegiate Athletic Association (NCAA) included 460,000 student athletes competing on 19,000 teams in 23 sports (NCAA, 2014). Evidence gathered since 1991, the appointment of a dietitian in 2012 to the NCAA Committee on Competitive Safeguards and Medical Aspects of Sport, and stories such as Shabazz Napier’s, who said he and other student athletes often went to bed hungry (Fowler, 2014), have shown or show the NCAA that then current regulations were too limiting. This is important to consider since optimal nutrition increases physical and cognitive performance (Markey, 2015). But student athletes are also at higher risk for inadequate and inappropriate nutrient intake due to cooking and shopping knowledge deficits, misinformation regarding nutrition, and distorted body images, all of which could pose future health risks (Cole et al., 2005; Dunn et al. 2007; Gleeson & Bishop, 2000). As a result, on August 1, 2014 NCAA officials lifted the regulations, often referred to as deregulations, that were in place to limit the nutrition support that affiliated Division I colleges and universities could provide student athletes (NCAA, 2014, Chapter 16) and then again on August 1, 2015, for Division II colleges and universities.
Problem Statement

Inadequate nutrient intakes not only compromise a student athlete’s ability to perform, but can have detrimental overall health effects, including the development of eating disorders (Cole et al, 2005), muscle damage, immune system suppression (Venkatraman & Pendergast, 2002), increased incidence of injury (Dekkers, van Doornen, & Kemper, 1996; Malinauskas, Overton, Carraway, & Cash, 2007), delayed healing, amenorrhea and bone density issues in women, cognitive dysfunction, and even death (Johnson, Powers, & Dick, 1999; Quatromoni, 2008).

Prior to deregulation, NCAA affiliated institutions were not permitted to give student athletes snacks or meals except in special situations where meals were missed due to competing away-from-home, prior to competition starting the night before and continuing until the student athletes were released, when student athletes were not permitted to leave their campus in order to participate in an event related to their sport, or when a meal was missed due to the scheduling of an institutional committee meeting of which the student athlete was a committee member (NCAA, 2013, Chapter 16). Training table meals prior to the updated regulation were deducted from student athletes’ board allowances who were receiving athletically-related financial aid. Those with partial scholarships or walk-ons were permitted to purchase the meals (NCAA, 2013, Chapter 16). Currently meals and snacks are considered to be “incidental to participation in intercollegiate athletics,” and there is little guidance for what these meals can consist of or for the systems utilized to distribute food (NCAA, 2014, Chapter 16).
The NCAA deregulation in 2014, for Division I and again in 2015 for Division II lifted guidelines that limit how nutrition support could be provided to student athletes. It also has given affiliated colleges and universities the ability to ensure that their student athletes receive enough energy from food and appropriate distribution of energy-producing substrates to match their increased need due to high physical demand. Colleges and universities are in a position to provide adequate, meaningful nutrition to athletes. However, with any guidance absent, the response to the deregulation varies. Several options do exist. One that has been frequently seen is the development of fueling stations, but these too lack any guidance and vary greatly between different institutions. The limited research, change in regulation, and inadequate nutrient intakes of student athletes necessitate the need for research into the development of fueling stations.

**Purpose Statement**

The purpose of this descriptive study was to determine the response of affiliated Division I and II colleges and universities to the National Collegiate Athletic Association’s deregulation of feeding players in relation to nutrition support, specifically fueling stations.

**Operational Definitions**

- Nutrition Support: Any individual or system in place with the purpose of providing student athletes with diet plans, nutrition education, food, beverages, or supplements.
• Deregulation: The action taken by the NCAA to change regulations in a way that makes them much less restrictive or to some extent makes the previous regulations inapplicable in 2014 for Division I schools and 2015 for Division II schools.

• Fueling Station: A location on a NCAA affiliated college or university which provides nutritional support to student athletes that was established after the deregulation of feeding NCAA student athletes; alternate terms include: feeding station, refueling station, feeding zone, and refueling zone.

• Student Athlete: An individual who engages in any intercollegiate sport.
CHAPTER II

REVIEW OF LITERATURE

Estimated Energy Requirements for Collegiate Student athletes

Total energy expenditure (TEE) is the amount of energy that a body requires in order to function for a given day (Dunford & Doyle, 2011). TEE consists of three parts; resting metabolism, thermic effect of food, and physical activity (Dunford & Doyle, 2011; Gerrior, Juan, & Bassiotis, 2006). The largest contributor to TEE for most individuals is resting metabolism. This can account for upwards of 70 percent of TEE, whereas physical activity accounts for approximately 20 percent and the thermic effect of food for 10 percent. Some factors influencing resting metabolism include sex, anthropometrics, age, genetics, exercise, body composition, food intake, and hormonal changes (Dunford & Doyle, 2011). Other terms often used interchangeably with resting metabolism are resting metabolic rate (RMR), basal metabolic rate (BMR), and resting energy expenditure (REE) (Dunford & Doyle, 2011). Resting metabolism, RMR, and REE are rightfully used to mean the same, while BMR is typically used to refer to measurements taken in a laboratory and is approximately 10 percent lower than resting metabolism (Dunford & Doyle, 2011).

Athletes’ energy calculations differ significantly from those of regular or sedentary individuals. The overall need for energy is increased, in some cases extremely so, due to increased physical activity. Sometimes the portion of TEE due to physical activity overtakes the portion of TEE due to resting metabolism. There are a number of
predictive equations and estimations for TEE, RMR, and calories used through physical activity. The Mifflin – St. Jeor Equation calculates RMR using weight, height, age in the formula. This formula has been shown to be more accurate than the Harris-Benedict and the WHO/FAO/UNU predictive equations (Dunford & Doyle, 2011; Frankenfield, Roth-Yousey, & Compher, 2005). The Cunningham Equation uses fat-free mass to generate RMR. This method would require an individual’s body composition be known prior to calculation (Dunford & Doyle, 2011).

Table 1

*Predictive equations used to estimate caloric needs of men and women.*

<table>
<thead>
<tr>
<th>Predictive Equation</th>
<th>Men</th>
<th>Women</th>
</tr>
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<tbody>
<tr>
<td>The Mifflin – St. Jeor</td>
<td>$9.99 \times \text{weight in kg} + (6.25 \times \text{height in cm}) - (4.92 \times \text{age}) + 5$</td>
<td>$9.99 \times \text{weight in kg} + (6.25 \times \text{height in cm}) - (4.92 \times \text{age}) - 161$</td>
</tr>
<tr>
<td>Harris-Benedict</td>
<td>$66 + (13.7 \times \text{weight in kg}) + (5 \times \text{height in cm}) - (6.8 \times \text{age})$</td>
<td>$655 + (9.6 \times \text{weight in kg}) + (1.8 \times \text{height in cm}) - (4.7 \times \text{age})$</td>
</tr>
<tr>
<td>WHO/FAO/UNU (Weight Only)</td>
<td>$18-30\text{y} (15.3 \times \text{weight} + 679)$</td>
<td>$18-30\text{y} (14.7 \times \text{weight} + 496)$</td>
</tr>
<tr>
<td></td>
<td>$31-60\text{y} (11.6 \times \text{weight} + 879)$</td>
<td>$31-60\text{y} (8.7 \times \text{weight} + 829)$</td>
</tr>
<tr>
<td></td>
<td>$&gt;60\text{y} (13.5 \times \text{weight} + 487)$</td>
<td>$&gt;60\text{y} (10.5 \times \text{weight} + 596)$</td>
</tr>
<tr>
<td>WHO/FAO/UNU (Weight and Height)</td>
<td>$18-30\text{y} (15.4 \times \text{weight} - 27 \times \text{height} + 717)$</td>
<td>$18-30\text{y} (13.3 \times \text{weight} + 334 \times \text{height} + 35)$</td>
</tr>
<tr>
<td></td>
<td>$31-60\text{y} (11.3 \times \text{weight} + 16 \times \text{height} + 901)$</td>
<td>$31-60\text{y} (8.7 \times \text{weight} - 25 \times \text{height} + 865)$</td>
</tr>
<tr>
<td></td>
<td>$&gt;60\text{y} (8.8 \times \text{weight} + 1,128 \times \text{height} - 1,071)$</td>
<td>$&gt;60\text{y} (9.2 \times \text{weight} + 637 \times \text{height} - 302)$</td>
</tr>
<tr>
<td>Cunningham</td>
<td>$(500 + (22 \times \text{fat free mass}))$</td>
<td>$(500 + (22 \times \text{fat free mass}))$</td>
</tr>
</tbody>
</table>

*Note.* (Dunford & Doyle, 2011; Frankenfield, Roth-Yousey, & Compher, 2005).
REE only accounts for a portion of TEE, and for athletes it can be a much smaller portion than for that of sedentary individuals. REE can change over long periods of time with increases in age and changes in anthropometric measurements, but the energy expended through physical activity can change day to day and even hour to hour. Physical activity level (PAL) can increase TEE by as much as two and a half times (Zello, 2006).

Energy expenditure through PAL is typically calculated through estimates based on intensity and duration of exercise through a system of metabolic equivalents (METs). One MET is equal to an average resting metabolic rate and increased intensity of activity results in an increase in the number of METS (Dunford & Doyle, 2011; IOM, 2005, Chapter 11). Tracking the various MET levels throughout a day and recording the duration at each level aids in the calculation of energy needs. METs for activities of daily living usually fall lower on the scale, such as doing dishes is measured at or assigned 2.1 METs, while athletics like rowing have a MET value of 19.1 (Jette, Sidney, & Blumchen, 1990).

Estimations for overall energy needs can also be made that include RMR, physical activity, and the thermic effect of food using scales based on physical activity level. For athletes, estimations recommend that sedentary males get 31 kcal/kg/d and females 30 kcal/kg/d, moderate intensity exercising males require 38 kcal/kg/d and females 35 kcal/kg/d, males training several hours a day require 41 kcal/kg/d and females 37 kcal/kg/day, rigorous training males require 45 kcal/kg/day and females between 38-40 kcal/kg/day, and males training extremely rigorously require 51.5 kcal/kg/d and in
some instances more than 60 kcal/kg/d and females 41 kcal/kg/d and up to more than 50 kcal/kg/d (Dunford & Doyle, 2011). This method of estimation has the benefit of being quicker, but with the drawback of being less accurate compared to other predictive equations.

**Macronutrient and Fluid Recommendations to Determine Energy Needs for Athletes**

Acceptable Macronutrient Distribution Ranges (AMDR) have been set forth by the Institute of Medicine (2005, Chapter 11) in order to minimize the risk of chronic disease while simultaneously ensuring that enough of each macronutrient is being consumed in order to supply the average American with sufficient amounts of essential nutrients found primarily within each macronutrient. Current recommendations for AMDRs are 20 to 35, 45 to 65, and 10 to 35 percent of energy from fat, carbohydrates, and protein, respectively (IOM, 2005, Chapter 11). The most recent joint position of the Academy of Nutrition and Dietetics (AND), Dietitians of Canada (DOC), and American College of Sports Medicine (ACSM) (2015), asserts that one of the most important aspects of recommendations for macronutrient of athletes is individualization.

**Carbohydrate Recommendations for Athletes**

The primary substrate for athletes, like all individuals, is carbohydrates (Dunford & Doyle, 2011). When the demand for energy exceeds the availability of carbohydrates, other substrates are used in order for the body to continue to function (Dunford & Doyle, 2011). Due to athletes’ increased PAL their need for energy, specifically from carbohydrates, exceeds that of sedentary individuals (Burke, Cox, Cummings, & Desbrow, 2001; Dunford & Doyle, 2011; Loucks, Kiens, & Wright, 2011).
The diets of collegiate athletes often demonstrate inadequate intake of carbohydrates during the time period in which they are participating in their sport, the repercussions of which vary depending on the severity of the inadequacy and the stature of the student athlete (Burke, Cox, Cummings, & Desbrow, 2001).

Recommendations for specific macronutrients are typically given in the form of number of grams per kilogram of bodyweight (g/kg), depending on activity duration and intensity (Burke, 2001; Burke, Kiens, & Ivy, 2003; Dunford & Doyle, 2011). Carbohydrate recommendations vary, but range between five and ten g/kg. Dunford and Doyle (2011) suggest a detailed breakdown in Table 2. Less detailed reflections of these estimates are seen in other research (ADA, 2000; Burke et al, 2001; Burke, 2001; Burke et al., 2003; Slater & Phillips, 2011).

**Protein Recommendations for Athletes**

The primary role of dietary protein is the maintenance of tissues within the body, but it can also be used as an energy source when needed (Dunford & Doyle, 2011; Phillips & Van Loon, 2011). This makes protein important for athletes because of an increased need to build and repair muscle tissue. Recommendations depend on the type of exercise or athletics being done (ADA, 2000; Dunford & Doyle, 2011; Phillips & Van Loon, 2011; Phillips, Moore, & Tang, 2007; Millward, 2003; Slater & Phillips, 2011; Tarnopolsky, Atkinson, MacDougall, Chesley, Phillips, & Schwarcz, 1992). Large differences exist between the recommendations of scientific researchers and the beliefs of non-scientific sport related groups (Phillips et al., 2007). Recommendations start at 0.8
g/kg for sedentary individuals and range up to 2.0 for strength athletes (Dunford & Doyle, 2011).

Recreational athletes with lower training volume and intensity are advised to have a protein intake of 1 g/kg, endurance athletes between 1.2 and 1.4 g/kg, ultraendurance athletes between 1.2 and 2.0 g/kg, and strength athletes between 1.2 and 2.0 g/kg (Dunford & Doyle, 2011). Other research narrows the range for strength athletes to 1.6 and 1.7 g/kg (ADA, 2000; Phillips et al, 2007; Slater & Phillips, 2011; Zello, 2006). Tarnopolski et al. (1992) is even more specific with a recommendation 1.76 g/kg.

**Fat Recommendations for Athletes**

The amount of fat athletes need depend on the difference between the combination of their carbohydrate and protein intakes and their TEE (Dunford & Doyle, 2011). The joint position stand of the American Dietetic Association, Dietitians of Canada, and American College of Sports Medicine (2000) recommends 20-30% of total energy intake be from fat. It is the only macronutrient recommendation expressed as a percentage instead of amount per unit of weight in the position stand. The statement, “consuming <20% of energy from fat does not benefit performance” suggests their concern for inadequate energy intakes due to concerns of negative effects of fats by athletes (ADA, 2000).

**Fluid Recommendations for Athletes**

Hydration status is crucial in the maintenance of overall health and optimization of athletic performance, and because of the increased loss of fluid through sweat
experienced by athletes, they are an at-risk population for dehydration. Dehydration not only causes decreases in performance, but can also have life-threatening implications (ADA et al., 2001). Adequate Intake (AI) recommendations are 3.0 liters per day (l/d) for college aged men and 2.2 l/d for college aged women (IOM, 2005, Chapter 4). These recommendations are set with light activity levels and moderate temperatures in mind (Whiting & Barabash, 2006). In addition to these values, recommendations exist to consume 400 to 600 mL of fluid two to three hours prior to exercise, 150 to 350 mL of fluid at 15-20 minutes intervals while exercising, and then enough fluid post exercise to compensate for any weight lost while exercising (ADA, 2000; Casa, Armstrong, Hillman, Montain, Reiff, Rich, et al., 2000). The ultimate goal of fluid intake for athletes is to be able to consume enough during exercise to replace increased losses from exercise (ADA, 2000; Noakes, 1993; Maughan, Merson, Broad, & Shirrefs, 2004). Losses during physical activity rarely exceed 1.2 liters per hours (Noakes, 1993).

**Nutrient Intake of Collegiate Student athletes**

Nutrient needs for student athletes are elevated when compared to the nutrient needs of sedentary individuals because of a much greater physical activity level (PAL), but this is not the only factor contributing to their increased risk of failing to reach their daily energy and nutrient needs (Hill & Davies, 2002; Hinton, Sanford, Davidson, Yakushko, & Beck, 2004; Holway & Wright, 2011; IOM, 2005, Chapter 12). Aspects of the environment exclusive to collegiate athletics and regulations that student athletes are required to abide by, such as competing in sports with weight restrictions like wrestling or that stress particular body size, such as gymnastics or long distance running, along
with inadequate food knowledge, financial support, and time to prepare or eat food, contribute to their risk factor (Burns, Schiller, Merrik, & Wolf, 2004; Hinton et al., 2004; Malinauskas, Overton, Cucchiara, Carpenter, & Corbett, 2007; Rash, Malinauskas, Duffrin, Barber-Heidal, & Overton, 2008).

**Carbohydrate Intakes of Collegiate Student Athletes**

A broad spectrum study conducted by Hinton, Sanford, Davidson, Yakushko, and Beck (2004) covering 13 different athletic disciplines and including 350 (185 males and 165 female) NCAA Division I student athletes using the most recent IOM macro- and micronutrient standards to estimate needs and the Youth Assessment Questionnaire (YAQ) to determine intakes, showed that male student athletes on average fall under their recommendations for energy of 2900 kcals by 453 kcals, while female student athletes show a negative balance on average of 59 kcals. Both male and female student athletes were deficient in carbohydrate intake on average, -115g and -32g respectively.

The smaller subgroup of female student athletes are at an even higher risk of nutrient deficiencies due to sport related body size requirements, physiologically increased needs for nutrients, and the increased risk of disordered eating behaviors (Fairburn & Harrison, 2003; Johnson, Powers, & Dick, 1999). Female student athletes from three different sports at a Division I university showed that 91% of the participants (n=62) had significantly lower intakes as compared to their needs (p < .001). Shriver, Betts, and Wollenberg (2013) note that while energy needs were not met, falling significantly lower than the recommendation of 5g/kg/day, the percentage of total energy intake coming from carbohydrates (53%) still met AMDRs for the general population.
This lends to the AMDRs being accurate indicators of macronutrient distributions, but only when total energy recommendations are met and suggests that macronutrient recommendations for athletes should be stated in grams per kilogram of body mass (g/kg) for all macronutrients, and not just for protein (Shriver, Betts, & Wollenberg, 2013).

Table 2

*Estimated carbohydrate recommendations depending on exercise intensity and duration*

<table>
<thead>
<tr>
<th>Exercise intensity and duration</th>
<th>Examples of sports</th>
<th>Daily carbohydrate recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high intensity, very short duration (less than 1 minute)</td>
<td>Track sprints</td>
<td>5-7 g/kg</td>
</tr>
<tr>
<td></td>
<td>Swimming sprints</td>
<td></td>
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<td></td>
<td>Weightlifting</td>
<td></td>
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<tr>
<td>High intensity, short duration (one to 30 minutes continuous)</td>
<td>Rowing</td>
<td>5-7 g/kg</td>
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<td></td>
<td>Figure skating</td>
<td></td>
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<tr>
<td></td>
<td>Mountain biking</td>
<td></td>
</tr>
<tr>
<td>High intensity, short duration (one to 30 minutes with some rest periods)</td>
<td>Gymnastics</td>
<td>5-8 g/kg</td>
</tr>
<tr>
<td></td>
<td>Wrestling</td>
<td></td>
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<td>Fencing</td>
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<tr>
<td>Moderate intensity, moderate duration (30 to 60 minutes)</td>
<td>10 km running</td>
<td>6-8 g/kg</td>
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<tr>
<td>Intermittent high intensity, moderate to long duration (more than one hour)</td>
<td>Soccer</td>
<td>6-8 g/kg</td>
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<td>Basketball</td>
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<td>Ice hockey</td>
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<tr>
<td>Moderate intensity, long duration (one to four hours)</td>
<td>Distance running</td>
<td>8-10 g/kg</td>
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<td>Distance swimming</td>
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<td>Distance cycling</td>
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<tr>
<td>Moderate intensity, ultra-long duration</td>
<td>Ultradistance running</td>
<td>8-10 g/kg</td>
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<td>Ultradistance swimming</td>
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<td>Ultradistance cycling</td>
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<tr>
<td>Low intensity, long duration (more than one hour)</td>
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<td>5-7 g/kg</td>
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<td>Baseball</td>
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<td>Softball</td>
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*Note.* (Dunford & Doyle, 2011)
Protein Intakes of Collegiate Student Athletes

Hinton et al. (2004) observed that 81 percent of male student athletes and 68 percent of female student athletes failed to reach the recommendation of 1.5 g/kg, while more than half of the participants in another study failed to reach their recommendation of 1.2 g/kg/bw (Shriver et al., 2013).

Male student athletes fell within the range for protein recommendations of 73-109g with a mean of 96.2g. Female student athletes exceeded their protein range of 55-83g with a mean intake of 87.8g. The presence of a protein range is caused by differing needs calculations based on the type of sport (Hinton et al., 2004). Protein intake among this population showed no significant difference when compared to the minimum recommendation of 1.2g/kg/day set forth by researchers, but it is noteworthy that 50% of participants had inadequate protein intake when individual dietary intakes were compared to recommendations (Shriver et al., 2013).

Fat Intakes of Collegiate Student Athletes

Studies show that fat intakes of student athletes meet or exceed recommendations in most situations (Hinton el al., 2004; Shriver et al., 2013; Cole et al, 2005). Student athletes in a wide variety of sports are consuming slightly more than the recommendation of 20 to 30 percent (ADA, 2000). Incoming freshman football players averages 31 percent of overall energy from fats, with 36 percent of those fats being saturated. As noted previously, AMDR recommendations can be misleading considering that as calories decrease the percentages stay the same. Lower overall energy intake could alter perceptions of appropriate macronutrient intakes. The average intake of 110 male student
athletes of various sports was 32 percent of their overall energy intake and in the same study women fell just under with an average of 28 percent of their overall energy intake coming from fat (Hinton et al., 2004). Female student athletes have been seen to exceed the recommendation of 30 percent of overall energy intake coming from fat (Shriver et al., 2013).

The chronic failure of student athletes to meet daily requirements for energy during the training for and participation in their respective sports is not inconsequential. Due to the demand for energy that is not being met by the energy intakes of student athletes, often times energy stores (i.e. fat and muscle) are used for energy, resulting in weight loss. This is made up for by one distinct characteristic of student athlete dietary intake, which is that it does not change depending on activity level. While training for or participating in sports, student athletes, when their PALs are at their highest, have the same or very similar dietary intakes as they do during their off-seasons.

**Fluid Intakes of Collegiate Student Athletes**

Fluid intakes of student athletes are not adequate (Burke & Hawley, 1997; Maughan et al, 2004; Noakes, 1993; Noakes, Adams, Myburgh, Greeff, Lotz, & Nathan, 1988). Fluid intakes should compensate for fluid losses during exercise, which vary depending on the duration and intensity of the physical activity. Intakes also range. Runners and canoeists had fluid intakes of between 0.29 per hour liters and 0.69 liters per hour, when losses ranged between 0.69 liters per hour and 1.27 liters per hour (Noakes et al., 1988). Runners and cyclists typically intake 0.5 liters of fluid per hour when losses range between 1.0 liters per hour and 1.2 liters per hour (Burke & Hawley, 1997). Noakes
(1993) reports slightly lower intakes for both running and cyclist in addition to an average intake of triathletes of 0.6 liters per hour. Football (soccer) players were noted to have intakes between 0.5 liters per hour and 1.5 liters per hour. They also show a positive correlation between fluid intake and fluid loss through sweat, though losses still exceeded intakes (Maughan et al., 2004).

**Micronutrient Considerations for Athletes**

Micronutrient needs for athletes are likely greater than those of non-athletes because a number are used in physiological processes that increase turnover and loss that are increased in athletes, such as the derivation of energy, rebuilding of muscle and bones after exercise, and in the creation of red blood cells (ADA, ADA, CD, 2000). Even so, the recommended daily allowance (RDA) for each micronutrient is set high enough to include 97.5 percent of the population (Barr, 2006). The RDA values for a number of micronutrients were set with the effect of physical activity considered including vitamin E, vitamin C, thiamin, vitamin B₆, iron, magnesium, choline, calcium, and sodium (Whiting & Barabash, 2006). As energy requirements increase in athletes, as long as this energy is not coming from foods devoid of micronutrients, the amount of micronutrients consumed increases, which aids in the prevention of inadequate micronutrient intake (ADA et al., 2000). A number of recommendations (ADA et al, 2000; Barr, 2006; Whiting & Barabash, 2006) still stand for increases in certain vitamins and minerals due to intense and prolonged physical activity and exercise. Considerations should be made for B vitamins because of their role in energy derivation and red blood cell productions, vitamins A, E, and C because of their antioxidant properties, iron for red blood cell
creation, calcium to help rebuild and remodel bone tissue, vitamin D because of the role it has in calcium absorption, and zinc because it is involved with building muscle, energy production, and growth (ADA et al., 2005). However, not all of which have RDAs that were set with physical activity in mind (i.e. vitamin D, vitamin A, B vitamins other than B₆, and zinc) (Maughan, 1999; Whiting & Barabash, 2006).

**Vitamin Considerations for Athletes**

Thiamin, riboflavin, niacin, pyridoxine, folate, biotin, pantothenic acid, and choline all have roles in the derivation of energy needed for physical activity from carbohydrates, fat, and protein (ADA, 2000; Lukaski, 2004; Manore, 2000). Due to increased turnover, metabolism, and absorption of these vitamins, recommendations have been made that slight to moderate increases of RDAs be instituted (Manore, 2000) and possibly increased to twice the level of current national recommendations (ADA, 2000). Deficiencies in B vitamins have been shown to decrease physical activity capacities (van der Beek, Van Dokkum, Schrijver, & van den Berg, 1994).

Vitamins A, C, and E possess antioxidant properties (ADA, 2000). These vitamins aid in reducing oxidative damage to cells, which can be elevated in those who engage in frequent physical activity, due to the increase in oxygen consumption (ADA, 2000; Clarkson, 1995; Ji, 1995). Trials to investigate the ability of supplementation of these antioxidants to reduce oxidative stress due to increased physical activity have shown that they can reduce post-exercise markers of lipid peroxidation, but did not reduce lipid peroxidation during exercise (Kanter, Nolte, & Holloszy, 1993). Exercise has been shown to increase the turnover of Vitamin E (Ji, 1995). Whether or not needs are
greatly increased due to physical activity and require supplementation is unknown (Clarkson, 1995)

Vitamin D is critically important for the absorption of Calcium, which is needed in order to optimize bone health (IOM, 1980; Lukaski, 2004; Ross, Manson, Abrams, Aloia, Brannon, Clinton, et al., 2011), and also has a role in maintaining muscle strength (Whiting & Barabash, 2006). Recommendation for college-aged individuals stand at 600 mg/d for both males and females (Ross et al., 2011). Populations at risk for low Vitamin D remain the same for athletes and non-athletes; and it includes those with darker skin pigmentation, and those in geographic regions that get less sunlight annually (Ross et al., 2011).

**Mineral Considerations for Athletes**

Similar to non-athletes, iron, used in the creation of hemoglobin and myoglobin, RDAs are set at 8 mg/d for male student athletes and 18 mg/d for female student athletes (Food and Nutrition Board & IOM, 2001, Chapter 9; Lukaski, 2004; Whiting & Barabash, 2006). Deficiencies of iron can result in reduced athletic or physical performance due to a decreased ability of the body to supply skeletal muscle with oxygen because of a reduction of hemoglobin (Food and Nutrition Board, IOM, 2001; Lukaski, 2004). It has been shown that endurance athletes can require as much as 70 percent more iron than the RDA (Whiting & Barabash, 2006). Iron deficiencies are seen in 25 to 36 percent of female athletes and between 11 and 15 percent of male athletes with and without anemia (Sinclair & Hinton, 2005). This is significantly greater than 12 to 16 percent and two percent of sedentary females and males, respectively (Sinclair & Hinton, 2005). It is not
yet known if iron loses due to degradation, inadequate intakes, or both are responsible for the anemic states of athletes, especially female athletes and endurance athletes (Clarkson, 1995).

The forces placed on the bodies of athletes cause microscopic fractures in bone (Clarkson, 1995). Calcium needs may be increased because of the increased need to repair and remodel bone tissue, and inadequate calcium intakes have been related to increased risk of stress fractures, especially among female athletes (ADA, 2000; Clarkson, 1995). Calcium may be lost through sweat during exercise, but overall resistance training has been show to increase bone density (Clarkson, 1995). Recommendations for calcium are 1000mg/d for college-aged athletes, both male and female (Ross et al., 2011). Males typically meet RDAs for calcium, but female athletes, particularly those involved in sports that require low body weights, do not meet their recommendations for calcium (ADA, 2000; Clarkson, 1995).

The functions of zinc in the body are vast and not all related to exercise and athletics, but include having a role in protein and nucleic acid synthesis, glucose use, insulin secretion, and regulatory actions related to hormones (Lukaski, 2004). This means that zinc can effect immune function, development of bone structures, and wound healing (Lukaski, 2004), three important issues for athletes. The RDA for Zinc is 8 mg/d for females and 11 mg/d for males (Food and Nutrition Board, IOM, 2001). Interest in the relationship between zinc and physical activity arose after Dressendorfer and Sockolov (1980) found that there was a significant inversely proportional relationship between zinc and the numbers of miles run by endurance runners during training (Lukasi, 2004). The
deficiencies were attributed to low intakes of animal products, increased intakes of high fiber foods, and additional losses, but increased recommended intakes for zinc are not suggested (Dressendorfer & Sockolov, 1980; Lukasi, 2004; Micheletti, Rossi, & Rufini, 2001).

**Food Availability**

The amount of food that universities could provide prior to the deregulation depended greatly on whether or not a student athlete was receiving an athletic scholarship. These scholarships are accompanied by allowances for room and board. The meal plan funds can be used by scholarship student athletes to eat at their school’s dining facilities and are drawn from to pay for meals provided as part of a training table. Non-scholarship, or “walk-on”, student athletes are not afforded these amenities. Access to meal plans and training tables comes with a fee that the student athlete is required to pay and varies between institutions (NCAA AMAS, 2013a, Chapter 16).

**Meal Plans**

Meal plans vary between institutions of higher learning. Some allot a certain number of meals a week, other set plans according to a monetary balance and money is deducted as it is used at university approved locations. Full scholarship student athletes typically receive at least 21 meals per week with the meal or board plan, or the highest plan according to monetary value. Partial athletic scholarship student athletes may receive a board allowance, but not to the extent of full scholarship student athletes.
Training Tables

A training table is a term used to refer to a meal offered to a student athlete by the university, typically in an exclusive setting and separate from other students. These meals are for full athletic scholarship student athletes, and the price or cost of the meal is deducted from the student athlete’s board allowance. Student athletes who are not receiving full athletic scholarship are permitted to buy these meals at whatever cost is being charged to the full athletic scholarship student athletes (NCAA AMAS, 2013a; Thomas, 2014).

Other Sources of Food

Despite training table meals and board plans student athletes still eat off campus frequently. Of 52 female collegiate student athletes surveyed, the average number of times each left campus to eat was 5.6 times per week, with 20% of these times being at fast food restaurants such as McDonald’s or Taco Bell (Shriver et al., 2013). College baseball players were also reported to eat fast food provided by the team while traveling (Malinauskas, 2007).

Changes in NCAA Guidelines Concerning Feeding Student Athletes

In 1991 the NCAA enacted guidelines that limited what and when affiliated colleges and universities food items could be provided to their student athletes (Markey, 2015). Student athletes could receive one meal per day in addition to their meal plans, while their sport’s season was active, in addition to fruits, nuts, and bagels (Markey, 2015; NCAA AMAS, 2013a). This was done in order to even the playing field and afford all schools the opportunities for success, not just the programs that had the most funding.
(Markey, 2015). These regulations stayed consistent for the next 23 years. In 2010 the CPSDA, an organization specializing in sports related nutrition at both professional and college levels, was officially incorporated (Markey, 2015). Shortly after, in 2012, CPSDA board member Amy Freel MS, RD, CSSD was appointed to the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports, which was closely followed by the release of the 2012 position stand “Recommended Feeding Protocol for All Athletes” (Markey, 2015). This document advocated the lifting of restrictions through extensive research showing that student athletes were not getting the nutrients that they needed (Rodriguez, 2009), something the CPSDA had been doing since the inception of this organization (Markey, 2015).

Division I was the first to begin deregulation in 2014 and has gone through the most change at this point in time. Division II delayed deregulation until 2015, and has yet to enact all of the changes that have been made in Division I. Division III has yet to enact deregulatory efforts in association with nutrition support.

**Division I Bylaws**

Effective August 1, 2014 the NCAA lifted the regulations limiting what and when food could be provided to student athletes from their colleges and universities. Meals and snacks are now considered “…a benefit incidental to participation in intercollegiate athletics” (NCAA AMAS, 2014a, Chapter 16). The long-standing fruit, nuts, and bagel rule was revised in 2014 to include anything considered a snack being permissible when incidental to participation, and then in 2015 the regulations were further revised to specifically mention that snacks can be provided to student athletes at any time and not in
conjunction with participation. What is considered a snack is not defined in the NCAA Division I Manual.

Regulations regarding training table meals, which prior to the regulation change were the biggest nutrient provision full athletic scholarship athlete could receive from their schools and provided one meal a day, have gone unchanged since 2007. The new regulations would seemingly supplant this regulation, but the training table meals regulation (16.5.2c) makes no mention of participation, only that they are available during the academic year, indicating that the regulation is stipulating that student athletes are able to get these during periods where there is no sport-related events occurring.

Student athletes have been provided meals before and after competitions since before the regulation updates; the rules have remained consistent since 2009 (NCAA AMAS, 2014, Chapter 16). Student athletes can receive meals at the expense of their school from the evening before competition until after the competition and the student athletes are released by the institutional authority. Division I colleges and universities may also now provide cash to student athletes in the event of a missed meal due to practice, but only if they have paid for the meal before.

The definition of acceptable supplements that could be provided to student athletes did not change with the feeding deregulation. The NCAA allows nutritional supplements for the purpose of providing energy and electrolytes, if they do not contain any NCAA banned substance. The NCAA defines acceptable nutritional supplements as falling into one of five classes: carbohydrate/electrolyte drinks, energy bars, carbohydrate
boosters, vitamins, and minerals. There is no mention of protein supplementation anywhere within the NCAA Manual.

**Division II Bylaws**

Division II did not adopt new regulations at the same time as Division I, but a year later. Revised January 8, 2015 and effective October 1, 2015, Division II student athletes may be provided with meals and snacks that are incidental to participation in intercollegiate athletics, save a provision specifically forbidding the provision of meals and cash for the same meal in the Division I regulation, the regulation of nutritional supplements for NCAA affiliated Division II colleges and universities is identical to that of Division I. At the time of the publication of this document, Division III had yet to change regulations regarding feeding student athletes.

**Initial Response by Affiliated NCAA Colleges and Universities to the Change in Regulations**

When asked at a strength and conditioning symposium in the summer of 2014 regarding what was going to be done after food restrictions were lifted Mickey Marotti, The Ohio State University’s head football strength and conditioning coach, repeatedly responded with, “I don’t know” (Rabinowitz, 2014). This seemed to be a common theme among college and university nutrition support staff members around the country, due to the abruptness and surprise involved in lifting limitations. Boise State University’s Athletic Director Mark Coyle said, “As I talk to ADs across the country, everybody is completely confused on what they are going to do” (Cripe, 2014). Division I and Division II NCAA affiliated colleges and universities are responding in many different ways, including increasing budgets for nutrition support, hiring dietitians, building new
facilities, increasing the amount and variety of food, and allowing more student athletes access to food in order to meet the dietary needs of student athletes.

**Development of Fueling Stations**

Designed to quickly provide healthy food options to student athletes, fueling stations were the initial outcome for a number of schools after the feeding deregulation. Ohio State was one of the very first schools publicly discussing their development of fueling stations. The size and structure of their football program allowed them to refit preexisting facilities to provide healthy snacks to student athletes. The University of Wisconsin has added similar facilities they are calling “refueling stations,” and have enhanced their training tables by allowing them to serve snacks at any time (Myerberg, 2015). Louisiana State University has added three similar establishments on their campus (Naverson, 2014), and Texas Christian University has opened one as of October 2014 (Youngman, 2014). While this seems to be the standard now, there are other options. The University of Oklahoma is operating a food truck that moves around to better provide student athletes with nutrition support (Youngman, 2014).

**Fueling Station Budgets**

There is a wide range of budgets allocated specifically for the purpose of feeding athletes, with the large schools in predominant conferences, the Big Ten, the Big 12, Atlantic Coast Conference, the Pacific Conference 12, and the Southeastern Conference, being at the higher end of that range. Twelve of these schools were surveyed by the Collegiate and Professional Sports Dietitians Association (CPSDA, 2015) and results showed that the average spending is approximately $1.3 million. This is an increase of
145% from the previous year (CPSDA, 2015). The smallest budget reported by the CPSDA (2015) was $200,000, which did not increase in the year after the deregulation. The highest budget reported was $2.8 million, an increase of $1.5 million. The greatest percent increase came from a program that was spending $50,000 prior to the change and $1.2 million after, an increase of 2,300% (Markey, 2015).

The Ohio State University is allocating $1.5 million for their sports nutrition program within intercollegiate athletics, which now includes four registered dietitians (Schonbrun, 2015). Penn State University is expecting to spend between $500,000 and $750,000 on their nutrition support system (Pennsylvania State University, 2014). Boise State University is trying to accumulate at least $1.1 million to spend on feeding student athletes, a sum that the University of Nebraska is also allocating to developing systems to feed student athletes (Binkley, 2015; Cripe). Oklahoma University’s program, including the food truck, is planning to spend about one million dollars in expansion efforts (Rovell, 2014), a number echoed by the University of Illinois (Binkley, 2015).

A discussion has arisen regarding the ability of larger colleges and universities with athletic programs that generate more revenue to increase the size of their nutrition support programs being much greater than colleges and universities that have lower sports-generated revenues. The little research available at this time seems to support this. Larger schools are being reported on by the CPSDA and in newspaper articles, while smaller schools, even those within Division I, are not. Many are mentioning that this will allow larger schools to increase the talent gap between themselves and others in an “arms race” where the quality and quantity of food available to student athletes will be used as a
bargaining chip in scholarship negotiations and to enhance performance itself, which was the catalyst for the installation of the legislation prior to 2014 regarding the provision of food to student athletes (Rovell, 2014; Schonbrun, 2015; Youngman, 2014).

Since the deregulation, money is also being spent to employ dietitians full time. Nineteen schools have hired their first full-time dietitian since 2014. Whether this is done with funds allocated specifically due to the regulation is unknown (Markey, 2015).

**Fueling Station Provisions**

The choice of what food is being given is left to the judgment of each school. The most frequently seen provisions in response to deregulation are snack foods (Cripe, 2014; Rovell, 2014; Schonbrun, 2015; Stark, 2015; Youngman, 2014), but they are not the only provision that student athletes are receiving at universities across the nation. A number of schools are expanding on the previous provision’s regulation of “fruits, nuts, and bagels,” by adding other snack foods like yogurt, sandwiches, nutrition bars, smoothies, beef jerky, trail mix, and many other foods that can be eaten quickly between practice and class (Stark, 2015; Youngman, 2014; Cripe, 2014). Others are building cafeterias specifically for student athletes. Like Auburn University’s Wellness Kitchen that offers full meals from a hot line for fresh meats, vegetables, and a pizza oven (Auburn University, 2015).

**Access to Fueling Stations**

Prior to the deregulations in 2014, there was a divide between student athletes who were on athletic scholarship and those who were not. Provisions could be provided
to full and partial scholarship student athletes through meal plans and board allowances that could not be provided to non-scholarship athletes (NCAA AMAS, 2013a). The deregulation now allows schools to provide for all student athletes, regardless of scholarship status (NCAA AMAS, 2014a). In 2013, Division I programs on average were feeding 368 student athletes. In 2014 that number increased to an average of 569 student athletes per school (Markey, 2015)
CHAPTER III

METHODOLOGY

The following section contains the methodology of this research. This includes the purpose, participants, survey details, procedures, and data analysis methods.

Research Design

The research design of this study was descriptive and non-experimental. This study examined the development of fueling stations at NCAA affiliated colleges and universities. In addition, this study looked to determine how much was being spent on food, equipment, and labor, who was deciding what foods were being offered, what equipment was needed in the development, who was manning fueling stations, if jobs were being created as a direct result of deregulation, how many student athletes were accessing fueling stations, and if those who did have access were being prescribed diets or being limited in what they could take in some way.

Purpose

The purpose of this descriptive study was to determine the response of affiliated Division I and II colleges and universities to the National Collegiate Athletic Association’s deregulation of feeding players in relation to nutrition support, specifically fueling stations.

Participants

A convenience sample of Registered Dietitians, Athletic Trainers and Strength and Conditioning Coaches was utilized for this study. Potential participants were
contacted one of two ways. The first way of contact was through membership of the professional organizations of the College & Professional Sports Dietitian Association (CPSDA) (N = 482) and the Collegiate Strength and Conditioning Coaches Association (CSCCa) (N = 1933). The second method of contact for athletic trainers (N = 625) and strength and conditioning coaches (N = 438) whose contact information was gathered from open source college and university staff athletic rosters. Participants were currently employed by a Division I or Division II NCAA-affiliated college or university and were involved with the development and/or management of the organization’s fueling station(s). Exclusion criteria included those who were not currently employed by Division I or Division II NCAA affiliated colleges or universities and also involved in the development and operation of their organization’s fueling station. The final exclusion criterion removed those from the survey process who were employed at institutions that did not respond in any way to the deregulation of feeding student athletes.

Survey

The questionnaire was developed by the researcher and distributed using the Qualtrics online survey tool. The questionnaire (Appendix A) began with an introduction which contained: (a) basic survey directions, (b) statement of voluntary participation, (c) contact information of the primary investigator for complaints or questions, and (d) an IRB consent form. If the participant agreed to participation in study, the survey contained five sections: Part I: General, Part II: Labor and Operations, Part III: Food and Equipment, Part IV: Access, and Part V: Demographics. Skip and display logic were utilized within the survey to only display question applicable to participants.
**General.** This section contained five closed-ended, single-answer, multiple-choice questions and one close ended, multiple-answer, multiple-choice question. The section helped to determine if the respondent was working at an NCAA-affiliated Division I or Division II college or university, which conference they belong to, if their school has a fueling station, and if they were involved with the planning, operation, or budgeting for the fueling station. Three questions were designed to end the survey if the respondent answers in the negative, because it would indicate that they were inappropriate for the study.

**Labor and Operation.** This section contained 10 (seven single-answer multiple-choice and three multiple-answer multiple-choice) close-ended questions, depending on how questions in the section were answered. The section helped to determine how much is being spent on fueling stations, the number of fueling stations, the format of the fueling stations, fueling station staff member demographics, labor cost information, and jobs creation due to the deregulation of feeding student athletes.

**Food and Equipment.** This section contained six (four single-answer multiple-choice and two multiple-answer multiple-choice) closed-ended questions. The section helped to determine what foods are being served, what percent of the budget is being spent on food, what equipment was needed, how much was spent on equipment, and if renovations were necessary.
Access. This section contained six (five single-answer multiple-choice and one multiple-answer multiple-choice) close-ended questions and one open-ended question. The section helped to determine when the fueling stations are accessible, how many student athletes have access, which students have access, if there are designed diets for athletes, and if there are limitations to access for certain athletes.

Demographics. This section contained four (single-answer multiple-choice) questions and one (multiple-answer multiple-choice) question. The section will help to determine the age, sex, and job title or position of the respondents.

Procedure

Kent State University Institutional Review Board approval was granted and the survey was administered via email. Email addresses provided by the CSCCA, and gathered from college and university staff athletic rosters were entered into Qualtrics, which distributed the recruitment email (APPENDIX B). This email contained a URL link to the survey (APPENDIX A). The CPSDA disseminated a URL link attached to a recruitment letter (APPENDIX B) to their members.

Once the participants opened the URL link they were presented with a consent form (APPENDIX C) that outlined that participation is voluntary and secures participant consent.

An email reminder was sent a week after the initial email and then again a week after that. Three weeks after the initial email the survey closed, at which point data was transferred to EXCEL and SPSS for analysis.
Data Analysis

SPSS software version 22 (IBM, New York) was used for statistical analysis.

Descriptive data was analyzed to determine frequency, means, and standard deviations.
CHAPTER IV

JOURNAL ARTICLE

Introduction

The increased physical activity of athletes requires an increase of energy intake from food (American Dietetic Association, Dietitians of Canada, & American College of Sports Medicine, 2009; Burke, 2001; Loucks, Kiens, & Wright, 2011). The intensity and duration of physical activity can necessitate increases ranging from more than just the energy needs of sedentary individuals to as much as two to four times as much as a sedentary individual (Loucks, et al., 2011). While training for the 2012 London Olympics, U.S. swimmer Michael Phelps reportedly consumed upwards of 12,000 calories a day (Scott, 2012). While an athlete may need more than two to four times as much energy from food as a sedentary individual, the distribution of the energy over the three energy supplying nutrients, protein, carbohydrates, and fat, remains the same (IOM, 2005, Chapter 11). One of the largest specific populations that exhibit an increased estimated energy requirement and are at risk for inadequate energy intake are college and university athletes in the United States. Total energy intakes of student athletes, especially from carbohydrates, fall well below estimated recommendations, on average. Even using light to moderate physical activity factors (Hinton et al., 2004) or minimum recommendations for carbohydrates (Shriver, Betts, & Wollenberg, 2013) to calculate the needs of student athletes, both males and females receive significantly fewer grams of carbohydrates than their estimated needs. Lack of knowledge or limited access to
nutrient dense foods attributes to the increased risk of inadequate energy intake (Cole, Salvaterra, Davis, Borja, Powell, Dubbs, et al., 2005; Dunn, Turner, & Denny, 2007; Rash, Malinauskas, Duffrin, Barber-Heidal, & Overton, 2008; Torres-McGehee, Pritchett, Zippel, Minton, Cellamare, & Sibillia, 2012).

In August of 1991, the NCAA modified rules to standardize what sustenance affiliated colleges and universities could provide to their student athletes in order to limit any advantages that more highly funded programs may receive. These regulations applied to all student athletes, which as of August 2014, between the three divisions defined by the National Collegiate Athletic Association (NCAA) included 460,000 student athletes competing on 19,000 teams in 23 sports (NCAA, 2014). Evidence gathered since 1991, the appointment of Amy Freel, Collegiate and Professional Sports Dietitians Association board member, in 2012 to the NCAA Committee on Competitive Safeguards and Medical Aspects of Sport, and stories such as Shabazz Napier’s, who said he and other student athletes often went to bed hungry (Fowler, 2014), have shown or show the NCAA that then current regulations were too limiting. This is important to consider since optimal nutrition increases physical and cognitive performance (Markey, 2015). But student athletes are also at higher risk for inadequate and inappropriate nutrient intake due to cooking and shopping knowledge deficits, misinformation regarding nutrition, and distorted body images, all of which could pose future health risks (Cole et al., 2005; Dunn et al. 2007; Gleeson & Bishop, 2000). As a result, on August 1, 2014 NCAA officials lifted the regulations, often referred to as deregulations, that were in place to limit the nutrition support that affiliated Division I colleges and universities
could provide student athletes (NCAA, 2014, Chapter 16) and then again on August 1, 2015, for Division II colleges and universities. The purpose of this study is to describe the reaction of NCAA affiliated colleges and universities to the deregulation of feeding student athletes, specifically in the form of fueling stations. The limited research, change in regulation, and inadequate nutrient intakes of student athletes necessitate the need for research into the development of fueling stations.

**Methodology**

The following section contains the methodology of this research. This includes the purpose, participants, survey details, procedures, and data analysis methods.

**Purpose**

The purpose of this descriptive study is to determine the response of affiliated Division I and II colleges and universities to the National Collegiate Athletic Association’s deregulation of feeding players in relation to nutrition support, specifically fueling stations.

**Participants**

A convenience sample of Registered Dietitians, Athletic Trainers and Strength and Conditioning Coaches was utilized for this study. Potential participants were contacted one of two ways. The first way of contact was through membership of the professional organizations of the College & Professional Sports Dietitian Association (CPSDA) (N = 482) and the Collegiate Strength and Conditioning Coaches Association (CSCCa) (N = 1933). The second method of contact for athletic trainers (N = 625) and
strength and conditioning coaches (N = 438) whose contact information was gathered from open source college and university staff athletic rosters. Participants were currently employed by a Division I or Division II NCAA-affiliated college or university and were involved with the development and/or management of the organization’s fueling station(s). Exclusion criteria included those who were not currently employed by Division I or Division II NCAA affiliated colleges or universities and also those not involved in the development and operation of their organization’s fueling station. The final exclusion criterion removed those from the survey process who were employed at institutions that did not respond in any way to the deregulation of feeding student athletes.

Survey

The questionnaire was developed by the researcher and distributed using the Qualtrics online survey tool. The questionnaire (APPENDIX A) began with an introduction which contained: (a) basic survey directions, (b) statement of voluntary participation, (c) contact information of the primary investigator for complaints or questions, and (d) an IRB consent form. If the participant agreed to participation in study, the survey contained five sections: Part I: General, Part II: Labor and Operations, Part III: Food and Equipment, Part IV: Access, and Part V: Demographics.

General. This section contained the statement, “The following section contains questions pertaining to the affiliation of your school and your involvement there.” It was followed by five closed-ended, single-answer, multiple-choice questions and one close ended, multiple-answer, multiple-choice question. The section helped to determine if the
respondent is working at an NCAA-affiliated Division I or Division II college or university, which conference they belong to, if their school has a fueling station, and if they were involved with the planning, operation, or budgeting for the fueling station. Three questions were designed to end the survey if the respondent answers in the negative, because it would indicate that they were inappropriate for the study.

**Labor and Operation.** All participants answered at least six questions in this section. Based on the responses, some answered up to 10 (seven single-answer multiple-choice and three multiple-answer multiple-choice) close-ended questions, depending on how questions in the section were answered. The section helped to determine how much is being spent on fueling stations, the number of fueling stations, the format of the fueling stations, fueling station staff member demographics, labor cost information, and jobs creation due to the deregulation of feeding student athletes.

**Food and Equipment.** This section contained six (four single-answer multiple-choice and two multiple-answer multiple-choice) closed-ended questions. The section helped to determine what foods are being served, what percent of the budget is being spent on food, what equipment was needed, how much was spent on equipment, and if renovations were necessary.

**Access.** This section contained six (five single-answer multiple-choice and one multiple-answer multiple-choice) close-ended questions and one open-ended question. The section helped to determine when the fueling stations are accessible, how many
student athletes have access, which students have access, if there are designed diets for athletes, and if there are limitations to access for certain athletes.

**Demographics.** This section contained four (single-answer multiple-choice) questions and one (multiple-answer multiple-choice) question. The section will help to determine the age, sex, and job title or position of the respondents.

**Procedure**

Kent State University Institutional Review Board approval was granted and the survey was administered via email. Email addresses provided by the CSCCA, and gathered from college and university staff athletic rosters were entered into Qualtrics, which distributed the recruitment email (APPENDIX B). This email contained a URL link to the survey (APPENDIX A). The CPSDA disseminated a URL link attached to a recruitment letter (APPENDIX B) to their members.

Once the participants opened the URL link they were presented with a consent form (APPENDIX C) that outlined that participation is voluntary and secures participant consent.

An email reminder was sent a week after the initial email and then again a week after that. Three weeks after the initial email the survey closed, at which point data was transferred to EXCEL and SPSS for analysis.
Data Analysis

SPSS software version 22 (IBM, New York) was used for statistical analysis. Descriptive data was analyzed to determine frequency, means, and standard deviations.

Results

Three hundred potential participants attempted the study survey, five participants were eliminated for working at neither a Division I or Division II college or university. An additional 96 participants were eliminated from the final analysis due to the fact that their college or university did not respond to the deregulation of feeding student athletes. Finally, 65 more participants were omitted from analysis because they indicated that they had no part in the planning, operation or budgeting of the fueling stations at their college or university. The final number of participant surveys analyzed was 134.

Participant Characteristics

The following section contains information about the characteristics of the participants including age, gender, job title, years in current position, and location of institution.

Age. The overall mean age of participants (n=106) was 35.18 years old, 28 participants (n=28 for Division I, n=2 for Division II) failed to complete this question. The mean age of those working at Division I colleges and universities (n=102) was 35.06 years old, and ages ranged from 21-63 years old. The mean age of those working at
Division II colleges and universities (n=4) was 38.2, and ages ranged from 36-42 years old.

**Gender.** Division I participants (n=102) consisted of 70 (68.6%) individuals who identified as male and 32 (31.4%) individuals who identified as female. Twenty-six participants failed to complete this question in Division I.

Division II participants (n=4) consisted of 3 (75.0%) individuals who identified as male and 1 (25%) individual who identified as female. Two participants failed to complete this question in Division II.

**Job Title.** Division I participants (n=100) consisted of 9 (9.0%) Registered Dietitians, 15 (15.0%) Registered Dietitians with a CSSD credential, 20 (20.0%) Athletic Trainers, and 56 (56.0%) Certified Strength and Conditioning Specialists. Twenty-eight participants failed to complete this question in Division I.

Division II participants (n=4) consisted of 2 (50.0%) Athletic Trainers and 2 (50.0%) Certified Strength and Conditioning Specialists. Two participants failed to complete this question in Division II.

**Years in Current Position.** Division I participants (n=98) ranged in time working at their current positions with the lowest being less than one year and the highest being 21 years. The average time in current position among these participants was 6.08 years. The calculation was done using six months for those under one year in their current position. The variability using one more and 11 months was five thousandths of one year,
or just over 18 days of variance. Thirty participants failed to complete this question in Division I.

Division II participants (n=4) ranged in time working at their current positions with the lowest being three years and the highest being 19 years. The average time in current position among these participants was 12.25 years. Two participants failed to complete this question in Division II.

**Location of Institution.** Division I participants (n=100) completed surveys from 35 separate states, with the highest number being from Ohio (n=11). The complete list can be seen in Table 3. The states that did not have a participant include Arkansas, California, Connecticut, Delaware, Hawaii, Indiana, Kansas, Maine, Montana, Nebraska, Nevada, New Hampshire, New Jersey, Oklahoma, and, Rhode Island. Twenty-eight participants failed to complete this question.

None of the Division II participants (n=6) reported what state their college or universities is located.

**Division**

Of participants (n=134), 128 (95.5%) indicated being at a Division I college or university, while 6 indicated being at a Division II (4.5) college or university. Despite the exclusionary criteria stated in the email that required participants to be working at an institution in Division I or Division II that responded to the deregulation, 50 individuals
at Division II institutions started the survey but indicated that their institution did not respond in any way to the deregulation.

The 128 participants who indicated being within a Division I college or university were separated into 19 conferences with an additional “Other” option. The distribution of the participants between conferences can be seen in Table 3.

Table 3

<table>
<thead>
<tr>
<th>Conference Name</th>
<th>f(n=128)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Athletic Conference</td>
<td>8</td>
<td>6.3</td>
</tr>
<tr>
<td>Atlantic Coast Conference</td>
<td>6</td>
<td>4.7</td>
</tr>
<tr>
<td>Big Ten Conference</td>
<td>13</td>
<td>10.2</td>
</tr>
<tr>
<td>Big 12 Conference</td>
<td>6</td>
<td>4.7</td>
</tr>
<tr>
<td>Conference USA</td>
<td>4</td>
<td>3.1</td>
</tr>
<tr>
<td>Mid-American Conference</td>
<td>12</td>
<td>9.4</td>
</tr>
<tr>
<td>Mountain West Conference</td>
<td>7</td>
<td>5.5</td>
</tr>
<tr>
<td>Southeastern Conference</td>
<td>9</td>
<td>7.0</td>
</tr>
<tr>
<td>Sun Belt Conference</td>
<td>5</td>
<td>3.9</td>
</tr>
<tr>
<td>Big Sky Conference</td>
<td>4</td>
<td>3.1</td>
</tr>
<tr>
<td>Big South Conference</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Colonial Athletic Association</td>
<td>5</td>
<td>3.9</td>
</tr>
<tr>
<td>Ivy League</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Mid-Eastern Athletic Conference</td>
<td>1</td>
<td>.8</td>
</tr>
<tr>
<td>Missouri Valley Football Conference</td>
<td>7</td>
<td>5.5</td>
</tr>
<tr>
<td>Ohio Valley Conference</td>
<td>1</td>
<td>.8</td>
</tr>
<tr>
<td>Patriot League</td>
<td>5</td>
<td>3.9</td>
</tr>
<tr>
<td>Southern Conference</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Southland Conference</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Other</td>
<td>27</td>
<td>21.1</td>
</tr>
</tbody>
</table>

The six participants who indicated being within a Division II college or university were separated into six conferences with an additional “Other” option. The distribution of the participants between conferences can be seen in Table 4.
Varsity Level Student Athletes

Information regarding the number of varsity level student athletes at the participant’s institution in Division I (n=125) was requested, with answers ranging in groups of 100 from less than 99 to greater than 500 varsity level student athletes. Of the respondents (n=125), 33 (26.4%) indicated that their institution had between 300-399 varsity level student athletes, 47 (37.6%) indicated that their institution had between 400-499 varsity level student athletes, 31 (24.8%) indicated that their institution had 500 or more varsity level student athletes, and one (0.08%) indicated that they did not know how many varsity level student athletes were at their institution.

Table 4

Employing Division II institution’s conference affiliation as reported by participants in fueling station survey

<table>
<thead>
<tr>
<th>Conference</th>
<th>f(n=6)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Collegiate Athletic Association</td>
<td>1</td>
<td>16.7</td>
</tr>
<tr>
<td>Great Midwest Athletic Conference</td>
<td>1</td>
<td>16.7</td>
</tr>
<tr>
<td>Great Northwest Athletic Conference</td>
<td>1</td>
<td>16.7</td>
</tr>
<tr>
<td>Gulf South Conference</td>
<td>1</td>
<td>16.7</td>
</tr>
<tr>
<td>Northern Sun Intercollegiate Conference</td>
<td>1</td>
<td>16.7</td>
</tr>
<tr>
<td>Peach Belt Conference</td>
<td>1</td>
<td>16.7</td>
</tr>
</tbody>
</table>

Division II institutions (n=6) reported at three (50%) had between 200-299 varsity level student athletes, one (16.7%) had between 300-399 varsity level student athletes, and two (33.3%) had between 400-499 varsity level student athletes. Results for both divisions can be seen in Table 5.

Access to Fueling Stations

Participants (n=134) were asked how many student-athletes have access to fueling stations at their institution. Among Division I participants who answered the question
(n=103) and Division II (n=4) the results can be seen in Table 6. Twenty-five participants in Division I and two participants in Division II failed to complete this question.

Table 5

*Number of varsity level student athletes attending Division I and Division II institutions as reported by participants in fueling station survey*

<table>
<thead>
<tr>
<th></th>
<th>Division I (n=125)</th>
<th>Division II (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>0-99</td>
<td>1</td>
<td>0.08</td>
</tr>
<tr>
<td>100-199</td>
<td>1</td>
<td>0.08</td>
</tr>
<tr>
<td>200-299</td>
<td>11</td>
<td>8.8</td>
</tr>
<tr>
<td>300-399</td>
<td>33</td>
<td>26.4</td>
</tr>
<tr>
<td>400-499</td>
<td>47</td>
<td>37.6</td>
</tr>
<tr>
<td>500 or more</td>
<td>31</td>
<td>24.8</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Table 6

*Number of varsity level student athletes who can access fueling stations in Division I and Division II institutions*

<table>
<thead>
<tr>
<th></th>
<th>Division I (n=103)</th>
<th>Division II (n=4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>0-99</td>
<td>7</td>
<td>6.8</td>
</tr>
<tr>
<td>100-199</td>
<td>12</td>
<td>11.7</td>
</tr>
<tr>
<td>200-299</td>
<td>13</td>
<td>12.6</td>
</tr>
<tr>
<td>300-399</td>
<td>25</td>
<td>24.3</td>
</tr>
<tr>
<td>400-499</td>
<td>26</td>
<td>25.2</td>
</tr>
<tr>
<td>500 or more</td>
<td>20</td>
<td>19.4</td>
</tr>
</tbody>
</table>

Participants were also asked if all of their student athletes had access to fueling stations. In response 84 (80.8%) Division I participants (n=103) indicated that all student athletes had access and 20 (19.2%) indicated that not all student athletes had access. If participants responded that not all student athletes had access then they were asked who did not (Division I: n=20, Division II: n=2). The results for which athletic teams could not access fueling stations can be seen in Table 7. A complete list of the write in responses can be found in APPENDIX D.
Table 7

Frequency of varsity level teams who do not have access to their institution’s fueling stations

<table>
<thead>
<tr>
<th>Men’s Sports</th>
<th>Division I (n=20)*</th>
<th>Division II (n=2)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td>Basketball</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td>Baseball</td>
<td>11</td>
<td>55.0</td>
</tr>
<tr>
<td>Soccer</td>
<td>9</td>
<td>45.0</td>
</tr>
<tr>
<td>Swimming</td>
<td>9</td>
<td>45.0</td>
</tr>
<tr>
<td>Gymnastics</td>
<td>8</td>
<td>40.0</td>
</tr>
<tr>
<td>Golf</td>
<td>14</td>
<td>70.0</td>
</tr>
<tr>
<td>Hockey</td>
<td>6</td>
<td>30.0</td>
</tr>
<tr>
<td>Lacrosse</td>
<td>8</td>
<td>40.0</td>
</tr>
<tr>
<td>Fencing</td>
<td>8</td>
<td>40.0</td>
</tr>
<tr>
<td>Volleyball</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td>Rowing</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td>Tennis</td>
<td>12</td>
<td>60.0</td>
</tr>
<tr>
<td>Track</td>
<td>10</td>
<td>50.0</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50.0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Women’s Sports</th>
<th>Division I (n=20)*</th>
<th>Division II (n=2)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lacrosse</td>
<td>10</td>
<td>50.0</td>
</tr>
<tr>
<td>Basketball</td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td>Softball</td>
<td>13</td>
<td>65.0</td>
</tr>
<tr>
<td>Soccer</td>
<td>12</td>
<td>60.0</td>
</tr>
<tr>
<td>Swimming</td>
<td>11</td>
<td>55.0</td>
</tr>
<tr>
<td>Gymnastics</td>
<td>9</td>
<td>45.0</td>
</tr>
<tr>
<td>Golf</td>
<td>10</td>
<td>50.0</td>
</tr>
<tr>
<td>Field Hockey</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td>Tennis</td>
<td>13</td>
<td>65.0</td>
</tr>
<tr>
<td>Track</td>
<td>11</td>
<td>55.0</td>
</tr>
<tr>
<td>Volleyball</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td>Water Polo</td>
<td>8</td>
<td>40.0</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td>Co-Ed Sports</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Bowling</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>10.0</td>
</tr>
</tbody>
</table>

* Total frequencies exceed n due to participants’ ability to select multiple answers within question.

Number of Fueling Stations

Information about the number of fueling stations operated at each institution was attained. Of the participants at Division I colleges and universities (n=110), 44 (40%) reported operating one fueling station and 23 (20.9%) reported operating five or more fueling stations. Eighteen participants failed to answer this question from Division I.
Division II colleges and universities (n=5) reported as one (20%) operating one fueling station, two (40%) operating two fueling stations, and two (40%) operating four fueling stations. No Division II institutions reported operating three locations or five or more locations. One participant failed to answer this question from Division II. Results for both divisions can be seen in Table 8.

Table 8

<table>
<thead>
<tr>
<th>Number of fueling stations</th>
<th>Division I (n=110)</th>
<th>Division II (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>44</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>17.3</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>13.6</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>8.2</td>
</tr>
<tr>
<td>&gt;4</td>
<td>23</td>
<td>20.9</td>
</tr>
</tbody>
</table>

Fueling Station Types

Participants were asked about the format of their fueling station. Of the participants at Division I colleges and universities (n=128), 32 (25%) described their fueling station as a dining hall and 113 (88.3%) described their fueling station as grab-n-go format. Originally 18 “other” options were selected, but upon review of write in answers 15 were considered to be grab-n-go, and one was considered a smoothie bar. The remaining write in response (one participant selected “other” but did not supply an alternative answer) described an extended training table.

Of the Division II participants (n=6), two (33.3%) described their fueling station as a dining hall and four (66.7%) described their fueling station as grab-n-go. There were
no reported food truck fueling stations or other among Division II participants. Results for both divisions can be seen in Table 9 and those separated by conference can be seen in Table 10. A complete list of the write in responses can be found in APPENDIX D.

**Budget Increase after Deregulation**

Participants were asked how much their budget for nutrition support initiatives increased after the deregulation. Of Division I colleges and universities (n=124), 44 (35.5%) reported an increase between $0-$49,999, 21 (16.9%) reported an increase between $50,000-$149,999, and four (3.2%) reported an increase of more than $1,500,000. Four respondents failed to answer this question from Division I. Results for both divisions can be seen in Table 11.

<table>
<thead>
<tr>
<th>Fueling station type</th>
<th>Division I (n=128)</th>
<th>Division II (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Dining hall</td>
<td>32</td>
<td>25</td>
</tr>
<tr>
<td>Grab-n-Go</td>
<td>113</td>
<td>88.3</td>
</tr>
<tr>
<td>Smoothie Bar</td>
<td>29</td>
<td>23.4</td>
</tr>
<tr>
<td>Vending Machine</td>
<td>6</td>
<td>4.7</td>
</tr>
<tr>
<td>Cafe</td>
<td>7</td>
<td>5.5</td>
</tr>
<tr>
<td>Food Truck</td>
<td>3</td>
<td>2.3</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1.6</td>
</tr>
</tbody>
</table>

*Total frequencies exceed n due to participants’ ability to select multiple answers within question.

Division II colleges and universities (n=6) reported that five (83.3%) saw budget increases between $0-$49,999, and one (16.7%) did not know. The Division II budget increases after deregulation broken down by conference can be seen in APPENDIX E.
Table 10

Frequency of fueling station types in each athletic conference\(^a\) at Division I and Division II institutions (n=134)

<table>
<thead>
<tr>
<th>Conference(^bc)</th>
<th>Dining Hall</th>
<th>Grab-N-Go</th>
<th>Smoothie Bar</th>
<th>Vending Machines</th>
<th>Cafe</th>
<th>Food Truck</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Athletic C.</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Atlantic Coast C.</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Big Ten</td>
<td>4</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Big 12</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Conference USA</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Mid-American C.</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mountain West C.</td>
<td>-</td>
<td>5</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Southeastern C.</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sun Belt C.</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Big Sky C.</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Big South C.</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Colonial A.A.</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Ivy League</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mid-Eastern Athletic C.</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Missouri Valley Football C.</td>
<td>-</td>
<td>7</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ohio Valley C.</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Patriot League</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Southern C.</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Southland C.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>21</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

| Division 2              |             |           |              |                  |      |            |       |
| Great Midwest Athletic C. | -          | 1         | -            | -                | -    | -          | -     |
| Great Northwest Athletic C. | -      | 1         | -            | -                | -    | -          | -     |
| Gulf South C.           | 1           | -         | -            | -                | 1    | -          | -     |
| Northern Sun Intercollegiate C. | -   | 1         | -            | -                | -    | -          | -     |
| Peach Belt C.           | 1           | 1         | 1            | 1                | 1    | -          | -     |

\(^a\) "C." is an abbreviation for conference.
\(^b\) "A.A." is an abbreviation for athletic association
\(^c\) Total frequencies exceed n due to participants’ ability to select multiple answers within question.

**Labor Cost**

Labor cost for operating fueling station were reported in percent of overall budget. Of the Division I colleges and universities (n=126), 70 (55.6%) reported that 0% of their budget is spent on labor, 14 (11.1%) reported that 20% of their budget is spent on labor, 5 (4.0%) reported that 40% of their budget is spent on labor, and 37 (29.4) reported
that they did not know what percent of their budget was spent on labor. Two participants failed to answer this question.

Division II participants (n=5) reported as 2 (40%) having a labor budget of 0%, 1 (20%) having a labor budget of 20%, and 2 (40%) reported that they did not know what percent of their budget was being spent on labor. One participant failed to answer this question. The results for both divisions can be seen in Table 12.

**Fueling Station Staff**

Of the participants at Division I colleges and universities whose institutions were operating fueling stations at the time of the survey (n=128), 88 (68.1%) indicated that their fueling stations were manned by a staff, meaning that they required personal in order to function. Another 40 (31.3%) participants indicated that their fueling stations were unmanned.

When needed, colleges and universities used a variety of different methods and individuals to man their fueling stations, both paid and unpaid. Among the 68.1% (n=88) of Division I colleges and universities using a staff to run fueling stations, 73 (57.1%) participants indicated the use of paid employees, both paid students (n=24, 18.8%) and paid university staff members (n=49, 38.2%). The use of unpaid employees is also a method used to operate fueling stations. Among Division I colleges and universities who indicated the use of unpaid labor (76, 59.4%), the most frequent responses included volunteers (n=14, 10.9%), dietetic students (n=24, 18.8%), exercise physiology students (n=9, 7.0%), and dietetic interns (n=19, 14.8%).
Among Division II colleges and universities, 4 (100%) of the institutions that required manpower to operate their fueling station indicated the use of paid university staff members for daily operation of fueling stations. Of the unpaid employee possibilities one (20%) respondent indicated the use of volunteers, and another (n=1, 20%) indicated the use of exercise physiology interns. Results for both divisions can be seen in Table 13.

Table 11

<table>
<thead>
<tr>
<th>Amount Increase</th>
<th>Division I (n=124)</th>
<th>Division II (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0-$49,999</td>
<td>44 (35.5%)</td>
<td>5 (83.3%)</td>
</tr>
<tr>
<td>$50,000-$149,999</td>
<td>21 (16.9%)</td>
<td>-</td>
</tr>
<tr>
<td>$150,000-$349,999</td>
<td>9 (7.3%)</td>
<td>-</td>
</tr>
<tr>
<td>$350,000-$749,000</td>
<td>3 (2.4%)</td>
<td>-</td>
</tr>
<tr>
<td>$750,000-$1,499,999</td>
<td>9 (7.3%)</td>
<td>-</td>
</tr>
<tr>
<td>$1,500,000 or more</td>
<td>4 (3.2%)</td>
<td>-</td>
</tr>
<tr>
<td>Declined to answer</td>
<td>7 (5.6%)</td>
<td>-</td>
</tr>
<tr>
<td>Unknown</td>
<td>27 (19.4%)</td>
<td>1 (16.7%)</td>
</tr>
</tbody>
</table>

Creation of Professional Positions

Participants were asked if the deregulation caused an increase in professional personnel positions including, but not limited to, registered dietitians, athletic trainers, fueling station managers, food service managers, and chefs. Job creation was indicated by 42 (32.8%) of the 128 participants in Division I. Of these, 31 (73.8%) indicated the hiring of a registered dietitian as a direct result of the deregulation. Of the participants (n=7) who indicated other jobs created as a direct result of the deregulation five provided position titles. Two of these are considered by researchers to be day to day operation of fueling station positions (dining hall staff and caterers), two are positions associated with
nutrition but may not be registered dietitians (part time nutrition student and nutritionist), and the last of the five was reported as a “Sports Nutrition Fellow”. No athletic trainer positions were created as a result of the deregulation.

Of the Division II colleges and universities (n=6), only one reported the addition of positions, for an athletic trainer, in direct relation to the deregulation. Results for both divisions can be seen in Table 14 and results delineated by conference can be seen in Table 15.

Table 12

*Frequency of percent of total budget used for labor of fueling stations cost in Division I and Division II institutions*

<table>
<thead>
<tr>
<th>Percent of Budget</th>
<th>Division I (n=126)</th>
<th>Division II (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>0</td>
<td>70</td>
<td>55.6</td>
</tr>
<tr>
<td>20</td>
<td>14</td>
<td>11.1</td>
</tr>
<tr>
<td>40</td>
<td>5</td>
<td>4.0</td>
</tr>
<tr>
<td>Unknown</td>
<td>37</td>
<td>29.4</td>
</tr>
</tbody>
</table>

**Deciding What Foods to Offer at Fueling Stations**

Participants were asked who was making the decisions for what foods were being offered in their fueling stations. Of Division I respondents (n=123), 50 (40.7%) responded that registered dietitians were deciding what foods were being offered, 50 (40.7%) responded that strength and conditioning coaching were deciding what foods were being offered, and 3 (2.4%) responded that someone other than the presented options (the ones listed above in addition to a team doctor) were deciding what foods were being offered in fueling stations.
The 3 participants who indicated “Other” were given the option to fill in their answers. Of these, there was one answered in a way that could be considered athletic director (Director of Operations), one indicated that an outside corporation made the decision, and one indicated that the cafeteria staff was making decisions on what foods were being offered in their fueling station.

Table 13

| Frequency of fueling station staff member types in Division I and Division II institutions |
|-----------------------------------------------|-----------------------------------------------|
| Paid                           | Paid student                  | University staff members |
| Division I (n=88)               | Division II (n=4)              |
| Paid                           | Paid student                  | University staff members |
| Paid students                  | Paid student                  | University staff members |
| 24                             | 18.8                          | 49                          |
| University staff members       | University staff members      |
| 49                             | 38.2                          | 4                           |
| Unpaid                         | Unpaid                        | Unpaid                      |
| Volunteers                     | Volunteers                    | Volunteers                  |
| 14                             | 10.9                          | 1                           |
| Dietetic students              | Dietetic students             | Dietetic students           |
| 24                             | 18.8                          | -                           |
| Exercise physiology students   | Exercise physiology students  | Exercise physiology students|
| 9                               | 7                             | 1                           |
| Athletic training students     | Athletic training students    | Athletic training students  |
| 3                               | 2.3                           | -                           |
| Dietetic interns               | Dietetic interns              | Dietetic interns            |
| 19                             | 14.8                          | -                           |
| Exercise physiology interns    | Exercise physiology interns   | Exercise physiology interns |
| 7                               | 5.5                           | -                           |

* Total frequencies exceed n due to participants’ ability to select multiple answers within question.

Table 14

<table>
<thead>
<tr>
<th>Jobs created as a result of deregulation of feeding student athletes in Division I and Division II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Title</td>
</tr>
<tr>
<td>Registered dietitian</td>
</tr>
<tr>
<td>Food service manager</td>
</tr>
<tr>
<td>Chef</td>
</tr>
<tr>
<td>Fueling station manager</td>
</tr>
<tr>
<td>Athletic Trainer</td>
</tr>
</tbody>
</table>

* Total frequencies exceed n due to participants’ ability to select multiple answers within question.

Of Division II participants (n=5), one (20%) indicated that a registered dietitian(s) was deciding what foods were being offered in their fueling station, three (60%) indicated that strength and conditioning coaches were deciding what foods were being offered in
their fueling stations, and one (20%) indicated that an athletic trainer(s) was deciding what foods were being offered in their fueling station. Results for both divisions can be seen in Table 16. A complete list of the write in responses can be found in APPENDIX D.

Table 15

Jobs created as a result of deregulation of feeding student athletes in each athletic conference of Division I institutions

<table>
<thead>
<tr>
<th>Conference</th>
<th>Registered Dietitian</th>
<th>Athletic Trainer</th>
<th>Food Service Manager</th>
<th>Chef</th>
<th>Fueling Station Manager</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Division I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Athletic C.</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Atlantic Coast C.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Big Ten</td>
<td>6</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Big 12</td>
<td>4</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Conference USA</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mid-American C.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Mountain West C.</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Southeastern C.</td>
<td>6</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Sun Belt C.</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Big Sky C.</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Big South C.</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Colonial A.A.</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ivy League</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mid-Eastern Athletic C.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Missouri Valley Football C.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ohio Valley C.</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Patriot League</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Southern C.</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Southland C.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>5</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

“C.” is an abbreviation for conference.

“A.A.” is an abbreviation for athletic association.

Total frequencies exceed n due to participants’ ability to select multiple answers within question.

Foods Offered at Fueling Stations
Participants were asked what foods were being offered at their fueling stations. The responses of Division I (n=128) and Division II (n=6) can be seen in Table 19. Originally “Other” was selected by 24 participants, but after review 11 responses were sorted into already existing categories (sandwiches, fresh fruit, juice, and nut spreads) or an additional category was created (beef jerky). The remaining “Other” responses included: Gatorade, hard boiled eggs, guacamole, pickles, almond milk, and soy milk in addition to comments stating that new products will be added as their fueling station expands. Only Division I participants wrote in “Other” options. A complete list of the write in answers can be found in APPENDIX D. Results for both divisions can be seen in Table 17.

Table 16

<p>| Food choice decision makers for fueling stations in Division I and Division II institutions |
|-------------------------------------|---------------------------------|----------------------------------|---------------------------------|</p>
<table>
<thead>
<tr>
<th>Job Title</th>
<th>Division I (n=128)</th>
<th>%</th>
<th>Division II (n=6)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered dietitian</td>
<td>50</td>
<td>40.7</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Strength and conditioning coach</td>
<td>50</td>
<td>40.7</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>Athletic trainer</td>
<td>5</td>
<td>4.1</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Athletic director</td>
<td>3</td>
<td>2.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Head coach</td>
<td>3</td>
<td>2.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Assistant coach</td>
<td>1</td>
<td>0.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Combination</td>
<td>8</td>
<td>6.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>2.4</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Prescribing Diets and Limiting Food

Participants (n=134) were asked if there were any systems in place to prescribe diets for athletes or systems in place to limit what, when, or how much student athletes could receive from fueling stations. Of Division I participant (n=104), 36 indicated that there were systems in place to prescribe diets and 55 indicated that there were systems in
place to limit access to fueling stations. Twenty-four Division I participants failed to complete these questions.

Table 17

*Frequency of food items available at fueling stations to student athletes in Division I and Division II institutions*

<table>
<thead>
<tr>
<th>Food Type</th>
<th>Division I (n=128)*</th>
<th>Division II (n=6)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Energy bars</td>
<td>77</td>
<td>60.2</td>
</tr>
<tr>
<td>Energy shakes</td>
<td>26</td>
<td>21.9</td>
</tr>
<tr>
<td>Protein bars</td>
<td>74</td>
<td>57.8</td>
</tr>
<tr>
<td>Protein shakes</td>
<td>64</td>
<td>60</td>
</tr>
<tr>
<td>Bagels</td>
<td>56</td>
<td>43.8</td>
</tr>
<tr>
<td>Hot and/or cold cereals</td>
<td>37</td>
<td>28.9</td>
</tr>
<tr>
<td>Granola</td>
<td>63</td>
<td>49.2</td>
</tr>
<tr>
<td>Sandwiches</td>
<td>44</td>
<td>34.4</td>
</tr>
<tr>
<td>Hot meals</td>
<td>13</td>
<td>10.2</td>
</tr>
<tr>
<td>Soup</td>
<td>8</td>
<td>6.3</td>
</tr>
<tr>
<td>Snack foods</td>
<td>49</td>
<td>38.3</td>
</tr>
<tr>
<td>Trail mix</td>
<td>76</td>
<td>59.4</td>
</tr>
<tr>
<td>Milk (1%)</td>
<td>34</td>
<td>26.6</td>
</tr>
<tr>
<td>Low fat chocolate milk</td>
<td>80</td>
<td>62.5</td>
</tr>
<tr>
<td>Yogurt</td>
<td>68</td>
<td>53.1</td>
</tr>
<tr>
<td>Cheese</td>
<td>49</td>
<td>38.3</td>
</tr>
<tr>
<td>Nuts</td>
<td>82</td>
<td>64.1</td>
</tr>
<tr>
<td>Nut spreads</td>
<td>53</td>
<td>41.4</td>
</tr>
<tr>
<td>Hummus</td>
<td>29</td>
<td>22.7</td>
</tr>
<tr>
<td>Fresh vegetables</td>
<td>39</td>
<td>28.1</td>
</tr>
<tr>
<td>Salads</td>
<td>13</td>
<td>10.2</td>
</tr>
<tr>
<td>Fresh Fruit</td>
<td>92</td>
<td>71.9</td>
</tr>
<tr>
<td>Dried Fruit</td>
<td>40</td>
<td>31.3</td>
</tr>
<tr>
<td>Fruit juice</td>
<td>29</td>
<td>22.7</td>
</tr>
<tr>
<td>Smoothies</td>
<td>36</td>
<td>28.1</td>
</tr>
<tr>
<td>Beef jerky</td>
<td>4</td>
<td>3.1</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>10.2</td>
</tr>
</tbody>
</table>

a Total frequencies exceed n due to participants’ ability to select multiple answers within question.

Of Division II participants (n=6), one indicated that there were systems in place to prescribe diets and two indicated that there were systems in place to limit access to

**Percentage of Budget Spent on Food**

Participants (n=134) were asked how much of their overall budget was spent on food. Of those in Division I (n=102), one (1%) indicating spending 20% of their overall
budget on food and 50 (49.0%) indicated spending 80% of their budget on food, and 39 (38.2%) did not know. Twenty-six participants in Division I failed to complete this question.

Participants (n=5) in Division II indicated that one (20.0%) used 40% of their overall budget on food, one (20.0%) used 80% of their budget on food, and three (60.0%) did not know. One participant in Division II failed to complete this question. There results can be seen in Table 18.

Table 18

<table>
<thead>
<tr>
<th>Percent of Budget</th>
<th>Division I (n=126)</th>
<th>Division II (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>40</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>60</td>
<td>8</td>
<td>7.8</td>
</tr>
<tr>
<td>80</td>
<td>50</td>
<td>49.0</td>
</tr>
<tr>
<td>Unknown</td>
<td>39</td>
<td>38.2</td>
</tr>
</tbody>
</table>

**Equipment Needs for Fueling Stations**

Participants (n=134) were asked what equipment was required in the development of their fueling station(s). The results of Division I (n=128) and Division II participants can be seen in Table 19. Originally “Other” was selected by 28 participants, but after review new categories were created for storage equipment, items to display food, milk dispenser, and technological equipment. Only Division I participants wrote in “Other” options. A complete list of the write in responses can be found in APPENDIX D.

**Cost of Equipment to Operate Fueling Stations**

Participants (n=134) were asked how much was spent on equipment in the development of their fueling station(s). Of participants in Division I who answered
(n=101), 53 (52.5%) indicated spending between $0-$24,999, two (2.0%) indicated spending more than $125,000, five (5%) declined to answer, and 35 (34.7%) did not know. Twenty-seven participants failed to complete this question in Division I.

Table 19

<table>
<thead>
<tr>
<th>Food Type</th>
<th>Division I (n=128)</th>
<th>Division II (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( f )</td>
<td>%</td>
</tr>
<tr>
<td>Large refrigerator</td>
<td>79</td>
<td>61.7</td>
</tr>
<tr>
<td>Under counter refrigerator</td>
<td>26</td>
<td>20.3</td>
</tr>
<tr>
<td>Microwave</td>
<td>42</td>
<td>32.8</td>
</tr>
<tr>
<td>Toaster</td>
<td>40</td>
<td>31.3</td>
</tr>
<tr>
<td>Blender</td>
<td>47</td>
<td>36.7</td>
</tr>
<tr>
<td>Water Spigot</td>
<td>16</td>
<td>12.5</td>
</tr>
<tr>
<td>Sport beverage/water dispenser</td>
<td>32</td>
<td>25.0</td>
</tr>
<tr>
<td>Oven</td>
<td>3</td>
<td>2.3</td>
</tr>
<tr>
<td>Hot plate</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Stove top</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Warming box</td>
<td>10</td>
<td>7.8</td>
</tr>
<tr>
<td>Vending machine</td>
<td>9</td>
<td>7.0</td>
</tr>
<tr>
<td>Milk dispenser</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Food displays</td>
<td>4</td>
<td>3.1</td>
</tr>
<tr>
<td>Organization/storage</td>
<td>9</td>
<td>7.0</td>
</tr>
<tr>
<td>Technology</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>10.2</td>
</tr>
</tbody>
</table>

* Total frequencies exceed n due to participants’ ability to select multiple answers within question.

Of participants in Division I who answered (n=5), two (40.0%) indicated spending between $0-$24,999 on equipment and three (60%) did not know. One participant failed to complete this question in Division II. These results can be seen in Table 20.

Renovations in the Development of Fueling Stations

Participants (n=134) were asked if their institution built, added on, or renovated in response to the change in regulations. Among the Division I participants who answered this question (n=105), 54 (51.4%) indicated that they did and 51 (48.6%) indicated that they did not. Twenty-three Division I participants failed to answer this question.
Among Division II participants who answered this question (n=4), one (25%) indicated that they did renovate, build, or add on facilities to accommodate their fueling stations.

Table 20

<table>
<thead>
<tr>
<th>Frequency of amount spent on equipment for fueling stations in Division I and Division II institutions</th>
<th>Division I (n=124)</th>
<th>Division II (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0-24,999</td>
<td>53</td>
<td>2</td>
</tr>
<tr>
<td>%</td>
<td>52.5</td>
<td>40.0</td>
</tr>
<tr>
<td>$25,000-74,999</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>%</td>
<td>5.0</td>
<td>-</td>
</tr>
<tr>
<td>$75,000-124,999</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>%</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>&gt;$125,000</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>%</td>
<td>2.0</td>
<td>-</td>
</tr>
<tr>
<td>Decline to answer</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>%</td>
<td>5.0</td>
<td>-</td>
</tr>
<tr>
<td>Unknown</td>
<td>35</td>
<td>3</td>
</tr>
<tr>
<td>%</td>
<td>34.7</td>
<td>60.0</td>
</tr>
</tbody>
</table>

Discussion

The deregulation of feeding student athletes at NCAA affiliated Division I and Division II colleges and universities, and subsequent development of fueling stations in accordance with this deregulation, has possibly been one of the most significant changes the NCAA has made. The deregulation has the potential to affect every athlete in every sport at more than 700 institutions across the country. This sentiment is reflected in this research, not only by the increased budgets for nutrition services as a direct result of the deregulation, reported by 95 participants, 13 of which indicated increases of more than $750,000, but also in the creation of jobs, both professional (n=51) and entry level jobs (n=77), the expansion of educational opportunities for student studying in exercise physiology, athletic training, and dietetics (n=78), and the expansion of university facilities to accommodate.
Division, Conference, and State Distribution

The total number of participants who were able to complete the survey (n=134) was lower than researchers hoped for, but even accounting for some duplicate surveys from the same institution it is likely a generalizable sample of NCAA affiliated Division I and Division II colleges and universities across the nation.

Originally more than 50 respondents from Division II schools attempted to complete the survey, but a large majority of them were excluded because their institutions did not at the point of the survey respond to the deregulation. This is significant because it indicates that Division II institutions have not been able to allocate funding or have not yet had enough time to develop their programs, since their deregulation occurred one year after the deregulation for Division I.

The conference distribution is not surprising. In addition to the conferences with the largest budgets and athletic health care teams such as the ACC, Big 10, Big 12, SEC, and assumedly at least five more schools from the PAC-12 based on geolocation, budget, and the selection of “Other” as conference, the most frequent conference seen to complete the survey is the conference through which the institution that conducted this research participants in, the MAC.

State distribution of participants reflected the same, with the most frequent being Ohio, the state in which the institution through which this research was done is located. The absence of completed surveys from Arkansas, California, and Nebraska was surprising considering both state population and number of institutions in California in addition not only the size but success of athletic programs in all three states.
Age and Time in Position

The age of participants and time in current position of participants may be indicative of a number of aspects related to the creation of jobs. Making inferences regarding the age gap between Division I and Division II participants in tenuous because of the number of Division II participants.

With that in consideration, the age of Division I participants on average was slightly over 35 and the age of Division II participants was slightly over 38. It has been shown that Division I schools are hiring dietitians, while the job of planning, manning, and operating fueling stations in Division II schools, and smaller Division I schools, is being left to other members of the student athlete health care team.

If the hiring of new registered dietitians is the factor influencing the age difference then it may be an indication that the institutions are hiring young and relatively inexperienced registered dietitians for these positions. This may be to lower the salary for the position, but in whatever case may be, the new position being filled by someone who is new to the profession may have an impact on the effectiveness of fueling stations. Other members of the health care team who have been advising student athletes on diets for long periods of time may feel like they still know what is best. This coupled with relationships that coaches have developed with student athletes may make the job of conducting effective nutrition counseling difficult.

Accessing Fueling Stations

A vast majority of participants (n=114) have more than 300 varsity level student athletes at their institution. With approximately 80% of participants stating that all teams
have access to fueling stations this is a much greater number than anticipated. While these kinds of numbers were expected out of Power 5 conference schools, and are demonstrated in other research of those conferences, it is great to see so many institution are able to provide for all of their athletes. This means that in most cases these fueling stations are being paid for by the school, and not by individual teams, which is a possibility if the funding is not available through their institution.

Of those who do not grant access to all teams, there was only participant indicated that their institution did not allow their football team to access fueling stations, which even though it is a single institution was unexpected.

The number of Women’s sports teams (n=126) who do not have access according to 20 participants is higher than the number of Men’s sports (n=133), despite there being more Men’s sports teams listed (15) compared to Women’s sports teams listed (12). This should be taken into consideration because of the health risks that female athletes face due to negative energy balance and physiological processes (Fairburn & Harrison, 2003; Johnson, Powers, & Dick, 1999). When similar or identical sports are compared (basketball to basketball, softball to baseball), more participants indicated that there were more Women’s teams that did not have access than Men’s teams, save one (golf).

**Fueling Station Formats**

The most widely indicated fueling station type was a Grab-N-Go format (n=117) between both divisions, with what is believe to be the standard or conventional definition of the term fueling station. Due to the unexpected nature of the deregulation and
unpreparedness that research shows, many of these were likely quickly established soon after the change.

While these may be the only fueling stations at smaller Division I and Division II schools, larger schools in Power 5 conferences are more likely to be expanding, creating, or designating entire dining halls with the explicit purpose of feeding athletes. The Big Ten, Big 12, and SEC all had four participants identify that were operating dining hall fueling stations. Dining halls specific to student athletes were seen in research, namely Auburn University’s Wellness Kitchen (Auburn University, 2015). The only other conference to record at least this many was the American Athletic Conference. This signifies and reinforces the spending power of institutions in the Power 5 conferences.

**Nutrition Services Budget Increases**

The most common response between both divisions to how much budgets have increased for nutrition support after deregulation was $0-$49,999 (n=49) follow by $50,000-$149,999 (n=21). This helps to more clearly define the spending ability of the majority of NCAA affiliated schools. Most of the literature, including work published by the CPSDA (Markey, 2015) and in newspapers, looks at schools like Auburn University (Auburn University, 2015), The Ohio State University (Schonburn, 2015), and Louisiana State University (Naverson, 2015) and illustrates figures well into the millions to be average spending after deregulation. Our results second those findings, but only for a very specific population. Results show that the only conferences that indicate budget increases over $350,000 are all Power 5, except for one in the American Athletic Conference.
This does not mean that it is completely necessary to spend that much in order to start or maintain a fueling station. Institutions are more likely to be operating fueling stations for much less than the highly publicized schools have been shown to spend.

**Job Creation**

The deregulation is shown with these results to have catalyzed the creation of jobs, both professional such as Dietitians and Chefs, and entry level jobs for day to day operations of fueling stations. While it may not be feasible for smaller Division I and Division II schools to create numerous positions as they create fueling stations, the increased job opportunities and possibly the realized need for sports dietitians at colleges and universities is a benefit to the deregulation. Thirty-one participants indicated the creation of jobs for Registered Dietitians. While this may not seem like a large number, and may be smaller due to survey duplication, compared to the CPSDA’s list of current Dietitians working full time in colleges and universities that consists of only 58 schools, it becomes a much more substantial number.

This increase in the number of full time dietitians seconds findings by Sarah Markey and the CPSDA, who found that there had been at least 19 full time dietitians hired as a direct result of the deregulation (Markey, 2015).

While research shows that both Athletic Trainers and Strength and Conditioning Coaches do hold an increased nutrition knowledge, the optimal person to develop and operate a fueling station due to training not only in nutrition, but food service management, is likely a Registered Dietitian.
Foods Offered

The five foods most commonly offered in fueling stations from most to least were fresh fruit, nuts, low fat chocolate milk, energy bars, and trail mix. Of participants who answered this question (n=104), 88.3% checked the answered estimated to be common food items in fueling stations. The popularity of these foods within fueling stations was also noted in research. Snack foods, or foods that are easy to eat on the go, are ideal for fueling stations for that reason.

The purpose of this question was to give information about what foods were being offered to those who are currently trying to or in the process of developing fueling stations. Not all colleges and universities have the benefit of having a staff dietitian. Even for small stations using this list as a guide (even just the top five items) should be beneficial.

This question also gives demonstrates the healthfulness of food offerings. What is being offered coupled with how much of it, which will be addressed later on, really does make or break the purpose of a fueling station. This research shows that the food currently being offered at participants’ institutions have been selected with the student athletes’ best interest in mind. It was, and still is, a concern that some institutions will give student athletes whatever they want whenever they want.

The foods being offered in general, and especially those offered most frequently do address the needs and known deficiencies that student athletes have been shown to have. The deficiencies in energy (Hill & Davies, 2002; Hinton, Sanford, Davidson, Yakushko, & Beck, 2004; Holway & Wright, 2011; IOM, 2005, Chapter 12) are being
addressed and brought closer to recommendations (Dunford & Doyle, 2011) with the existence of the fueling stations at institutions that responded to the deregulation of feeding student athletes.

Research also shows intakes of carbohydrates (Hinton, Sanford, Davidson, Yakushko, and Beck, 2004; Shriver, Betts, & Wollenberg, 2013) fall short of recommendations (ADA, 2000; Burke et al, 2001; Burke, 2001; Burke et al., 2003; Dunford & Doyle, 2011; Slater & Phillips, 2011). A number of items indicated by participants are likely to specifically address this carbohydrate deficiency such as energy shakes, energy bars, fruits, bagels, and snack foods.

There has also been a documented deficiency of protein intake among student athletes (Hinton et al., 2004; Shriver et al., 2013) when compared to recommendations (ADA, 2000; Dunford & Doyle, 2011; Phillips et al, 2007; Slater & Phillips, 2011; Zello, 2006). A number of items indicated by participants specifically address this discrepancy such as protein shakes, protein bars, nuts, nut spreads, beef jerky, chocolate milk, and likely most hot meals. These items indicate that this change in regulation of feeding student athletes is being used to provide student athletes with the nutrients that they have shown to be lacking.

This research also looks into who is making the decisions for what foods are available in fueling stations. Participants indicated 110 times that these decisions were being made by Registered Dietitians, Strength and Conditioning Coaches, or athletic trainers. These people have been shown to have the highest nutrition knowledge. Other
people indicated to be making these decisions include athletic directors, head coaches, and assistant coaches. Notably the write in answers (n=8) which indicated that a team approach to make decisions for what foods to be served, and hopefully this extends to what foods should be served to particular student athletes. Most of the combinations included as many of the three primary decision makers as possible, which is a valuable approach. This would ensure that student athletes with injuries or ones who are undergoing extensive or specialize training programs get the nutrients they need, but no more or no less. A complete list of the write in responses can be found in APPENDIX D.

**Diet Prescriptions and Food Limitations**

One of the biggest concerns with this deregulation of feeding student athletes is the supplementation of too much food. It has been established that athletes, especially those in the 18-23 age range have special risks involved with under nourishment and that they lack nutrition knowledge, but there are also concerns regarding obesity after graduation as activity levels drop. Of the 134 participants only 37 indicated that there were systems in place to prescribe diets. Keep in mind that one of the many statements made in the AND position stand on sports nutrition is the importance of individualization of diets for athletes (AND, DOC, ACSM, 2016).

Another 57 participants indicated that there were systems in place to limit how much, how often, and what student athletes could get from fueling stations. It is appropriate to postulate that some of these limitations are based on budgetary restrictions and not student athletes’ needs, but limitations for whatever reason are likely to benefit.
A number of the write in responses indicated that limitations were based on what was available and how long it would last.

The NCAA slogan famously states, “There are over 400,000 NCAA student athletes, and most of us will go pro in something other than sports.” Only one of the answers regarding systems in place to limit food from fueling stations mentioned the use of nutrition education. This is concerning due to the fact that many former student athletes deal with obesity after their college athletic careers end. It is even mentioned on the NCAA website in an article by Jenny Moshak (2013) that many former college student athletes deal with obesity after college because when their activity levels decrease their food intake does not.

Those who do have a system in place to either limit what student athletes receive from fueling stations or have individualized diets in place may not be as effective as the institutions perceive them to be. This research indicates that a number of institutions are developing electronic tracking systems through I.D. card swiping, but a number of others have put the choice of how much or how often student athletes can access to the coaches or have students monitor the stations. The student involvement in fueling stations (dietetic students, exercise physiology students) can work to reduce labor cost, but may not be advantageous when monitoring and limiting what student athletes get. By nature these individuals do not have all of the required information to make these choices.

Coaches are shown to be involved in the allowance of access of student athletes to fueling stations as well. This seems to run counter to the information about stocking fueling stations. If coaches are not making the decisions for what foods the student
athletes can possibly receive, they likely cannot make the best decisions as to how much
or how often student athletes can access the stations. Many respondents commented that
access frequency and amount are determined by the number of workouts or perceived
activity level of student athletes. This approach to nutrition support of student athletes
just does not seem feasible on a day to day basis. It is in keeping with research supporting
the need for individualization of diets and nutrition care, but to track the energy use of
hundreds of athletes in practice environments every day may lead to under nourishment
of athletes who may be expending more energy than coaches perceive.

**Equipment Needs, Cost, and Renovations**

The five most indicated pieces of equipment needed in the development of fueling
stations were a large refrigerator, blender, microwave, toaster, and a sports beverage or
water dispenser. Like the question about foods offered, this question was designed to help
give an idea to those trying to or in the process of developing a fueling station as to what
equipment was absolutely necessary.

These results also emphasize and illustrate the magnitude of most fueling stations.
The most indicated items part participants show that these fueling stations are not
cooking whole meals. A refrigerator and a blender or a refrigerator and a microwave can
provide athletes with sustenance throughout the day without constructing an entire dining
hall.

Most participants (n=53) spend less than $24,999 on equipment and 51
participants indicated that they did not need especial facilities constructed or existing
facilities renovated in order to operate a fueling station. Both examples of the budgetary requirements for developing fueling stations.

**Limitations**

The survey did not include questions concerning the coupling of nutrition education with the new increased availability of food. This information could have been used to analyze how much athletes were told about the foods they were receiving and the relationship between the food they are eating and their activity level.

The broad spectrum nature and promised anonymity of this research allows for the duplication of information when schools have multiple employees (multiple dietitians, athletic trainers, and strength and conditioning coaches). While information such as conference and state allows for the correction of these duplications to some extent, some duplicates were likely included in the data analysis.

Some schools belong to both divisions surveyed in this research and respond differently to the deregulation for their Division I schools than they do for their Division II schools. When asked, participants were advised to complete the survey once as a Division I school and then again as a Division II school.

The Pacific-12 conference was not included in the list of conferences for Division I schools. While inferences can be made using the selection of “Other” as a conference, higher budgetary increases, and state of location, definitive results were not based or calculated with these participants assumable residing in the Pacific-12 conference. A complete list of the write in responses can be found in APPENDIX D.
The sample size for this study did not meet expectations. This may be due to the recent nature of the change in deregulation in Division II institutions. The view of fueling stations among Division I institutions from this research has been enlightening, but there is still a lot to learn about the ones, if any, that are operating in Division II.

**Recommendations for Future Research**

The discovery of whether or not the deregulation of feeding student athletes is having the desired effect needs to be made at some point, though presently this researcher believes it to be too soon to gather conclusive data. Once student-athletes have been within institutions that operate a fueling station or fueling stations for the entirety of a college career then comparisons can be made between pre and post fueling station performance and injury rates, among other subjects.

One write in answer regarding the food options in fueling stations noted that an “Outside Corporation” was in charge of supplying food for their fueling station. This is interesting because of what it could imply. If they mean that there is a company who is developing and operating fueling stations for colleges and universities then it would be fascinating to learn more. Researchers have yet to read about any such company. The participant may also just be referring to a food distributor such as Sodexo or U.S. Foods.

The ability of larger, Power 5 conference schools, to allocate much greater sums to nutrition support services such as fueling stations as compared to other institutions within Division I and Division II may cause an even greater talent gap between the two. It is currently too early to completely understand if this has or will happen, research
should be done at some point to identify the ramifications of the deregulation in regard to recruitment in addition to performance.

**Applications**

Throughout the data collection process numerous emails were sent to the researcher indicating that while they were interested in developing a fueling station, that their institution was tentative about start one, a decision based primarily on budgetary restraints. It is the hope of this research that this analysis on the development of fueling stations can be used as evidence that fueling stations can be operated at relatively low cost with a vast majority of the budget spent on food and not labor. In addition, this research can be used by those institutions with smaller athletic health care teams as a guide for what foods are most often provided, what equipment is needed, and who can potentially work to operate the fueling station at minimal or no labor costs.

Participants also mentioned that their fueling stations were in the process of being expanded or that they were “entering phase II”. A revamp of fueling stations at this point for those who very quickly developed after the deregulation makes sense. Hopefully this research is valuable in those situations as well as a tool for introspective analysis of what they can do or what they can do better.

For those participants whose institutions are not currently prescribing diets or limiting food this research highlights the importance of diet prescription and limitations when food is very available.
Conclusion

Fueling stations are not limited to only the large Division I colleges and universities. These institutions can afford to build more complete and encompassing nutrition support systems with more staff members accommodating a large number of athletes, but that is not the only way to approach the addition of a fueling station after the deregulation, and may in fact be counter to the goal of the deregulation.

While it is understandable that not all NCAA affiliated Division I and Division II schools can afford to have a staff sports dietitian it is still important to ensure that student athletes are having their nutrition needs met. This means not only are they getting enough to eat, but that they are not eating too much, and are eating the things that they need on an individual basis.
APPENDICES
APPENDIX A

SURVEY
SURVEY

Fueling Stations

Q1 The Response of American Colleges and Universities to the National Collegiate Athletic Association’s Deregulation of Feeding Student Athletes in Relation to Nutrition Support

Welcome to our study, it is a web-based experiment that examines colleges and universities responses to the NCAA deregulation of feeding student athletes. Before taking part in this study, please read the consent form below and click on the "I Agree" button at the bottom of the page if you understand the statements and freely consent to participate in the study.

Consent Form

The purpose of this study is to obtain information regarding the response to the deregulation of feeding student-athletes at NCAA affiliated colleges and universities, specifically the development of fueling stations. This study is being conducted by Dr. Amy Miracle and Ellsworth Smith a graduate student in Nutrition at Kent State University and has been approved by the Kent State University Institutional Review Board. No deception is involved and the study involved no more than minimal risk to participants. Your answers are confidential and will be reported only as grouped data. The survey takes approximately 10 minutes to complete and is strictly anonymous. The survey consists of five sections regarding nutrition support at your university or college including general, labor and operation, food and equipment, access, and a short demographic section. Each section contains between six and 11 questions designed to help better understand specific topics related to fueling stations. All responses are treated as confidential, and in no case will responses from individual participants be identified. Rather, all data will be pooled and published in aggregate form only. Participants should be aware, however, that the experiment is not being run from a "secure" https server, so there is a small possibility that responses could be viewed by unauthorized third parties (e.g., computer hackers). Participation is voluntary, refusal to take part in the study involves no repercussions and participants may withdraw from the study at any time. If participants have further questions about this study or their rights, or if they wish to lodge a complaint or concern, they may contact the principal investigator, Professor Amy Miracle, at amiracle@kent.edu; or the Kent State University Institutional Review Board, at (330) 672-2704.

Consent If you are 18 years of age or older, understand the statements above, and freely consent to participate in the study, click on the "I Agree" button to begin the survey.

- I Agree (1)
- I Do Not Agree (2)

If I Do Not Agree Is Selected, Then Skip To End of Survey
Q2 The following section contains questions pertaining to the affiliation of your school and your involvement there.

Q3 Do you work at or for a NCAA affiliated Division I or Division II college or university?

- Division I (1)
- Division II (2)
- Neither (3)

If Neither Is Selected, Then Skip To End of Survey
Answer If Do you work at or for a NCAA affiliated Division I or Division II college or university? Division I Is Selected
Q4 Of which conference is your college or university a member?

- American Athletic Conference (1)
- Atlantic Coast Conference (2)
- Big Ten Conference (3)
- Big 12 Conference (4)
- Conference USA (5)
- Division I FBS Independents (6)
- Mid-American Conference (7)
- Mountain West Conference (8)
- Southeastern Conference (9)
- Sun Belt Conference (10)
- Big Sky Conference (11)
- Big South Conference (12)
- Colonial Athletic Association (13)
- Division I FCS Independent (14)
- Ivy League (15)
- Mid-Eastern Athletic Conference (16)
- Missouri Valley Football Conference (17)
- Northeast Conference (18)
- Ohio Valley Conference (19)
- Patriot League (20)
- Pioneer Football League (21)
- Southern Conference (22)
- Southland Conference (23)
- Southwestern Athletic Conference (24)
- Other (25) ____________________
Q5 Of what conference is your college or university a member?

- California Collegiate Athletic Association (1)
- Central Atlantic Collegiate Conference (2)
- Central Intercollegiate Athletic Association (3)
- East Coast Conference (4)
- Great American Conference (5)
- Great Lakes Intercollegiate Athletic Conference (6)
- Great Lakes Valley Conference (7)
- Great Midwest Athletic Conference (8)
- Great Northwest Athletic Conference (9)
- Gulf South Conference (10)
- Heartland Conference (11)
- Lone Star Conference (12)
- Mid-America Intercollegiate Athletics Association (13)
- Mountain East Conference (14)
- Northeast Ten Conference (15)
- Northern Sun Intercollegiate Conference (16)
- Pacific West Conference (17)
- Peach Belt Conference (18)
- Pennsylvania State Athletic Conference (19)
- Rocky Mountain Athletic Conference (20)
- South Atlantic Conference (21)
- Southern Intercollegiate Athletic Conference (22)
- Sunshine State Conference (23)
- Other (24) ________________

Q6 Did your school respond to the deregulation of feeding student athletes?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To End of Survey

Q7 Colleges and universities across the country are responding to the deregulation of feeding student athletes in a variety of way. Schools are building grab and go installations, dining halls, installing vending machines, and in one case operating a food truck. These installations have been called feeding stations, refueling stations, fueling
zones, and a number of other terms specific to nutrition support venues developed after the NCAA's deregulation. For the purposes of this survey these all be referred to as fueling stations.

Q8 Are you involved with the planning, operation, or budgeting for fueling stations?
- Planning (1)
- Operation (2)
- Budget (3)
- None (4)

If None Is Selected, Then Skip To End of Survey

Q9 How many varsity level student-athletes does your school have?
- 0-99 (1)
- 100-199 (2)
- 200-299 (3)
- 300-399 (4)
- 400-500 (5)
- >500 (6)
- Unknown (7)

Q10 The following section contains questions pertaining to labor and operation associated with fueling stations.

Q11 How much additional funding has been allocated for implementation of nutrition support initiatives since the change in the NCAA regulation for feeding student-athletes annually?
- $0-$49,999 (1)
- $50,000-$149,999 (2)
- $150,000-$349,999 (3)
- $350,000-$749,999 (4)
- $750,000-$1,499,000 (5)
- >$1,500,000 (6)
- Decline to answer (7)
- Unknown (8)
Q12 How many separate locations to provide student athletes with food is your college or university currently operating?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- >4 (5)

Q13 How would you describe the serving format of your fueling station(s)? (check all that apply)

- Dining Hall (1)
- Grab - N - Go (2)
- Smoothie Bar (3)
- Vending (4)
- Cafe (5)
- Food Truck (6)
- Other (7) ____________________

Q14 Are your school's fueling stations manned by a staff member?

- Yes (1)
- No (2)

Q15 Who is manning the fueling station(s)? (check all that apply)

- Paid students (1)
- University Staff Members (2)
- Non-student Volunteers (3)
- Dietetic Students (4)
- Exercise Physiology Students (5)
- Athletic Training Students (11)
- Hospitality Management Students (6)
- Dietetic Interns (7)
- Exercise Physiology Interns (8)
- Athletic Training Interns (10)
- Hospitality Management Interns (9)
Q16 How many paid full time equivalents are needed to operate fueling stations?

- (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- 7 (8)
- 8 (9)
- 9 (10)
- 10 (11)
- 11 (12)
- 12 (13)
- 13 (14)
- 14 (15)
- 15 (16)
- 16 (17)
- >16 (18)
- Unknown (19)

Q17 What percent of the total fueling station budget is used for labor cost?

- 0% (1)
- 20% (2)
- 40% (3)
- 60% (4)
- 80% (5)
- Unknown (6)

Q18 Have jobs other than those to staff fueling stations been created as a direct result of the deregulation of feeding student-athletes? (ex. Registered Dietitian, Athletic Trainer, Chef)

- Yes (1)
- No (2)
Answer If Have jobs other than staffing fueling stations been created as a direct result of the deregulation of feeding student-athletes? Yes Is Selected

Q19 How many professional jobs other than manning fueling stations have been created as a direct result of the deregulation of feeding student-athletes? (ex. Registered Dietitian, Athletic Trainer, Chef)

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- >5 (6)
- Do not know (7)

Q20 What jobs have been created as a direct result of the deregulation? (check all that apply)

- Dietitian (1)
- Athletic Trainer (2)
- Food Service Manager (3)
- Chef (4)
- Fueling Station Manager (5)
- Other (6) ____________________

Q21 The following section contains questions pertaining to foods provided to student-athletes and equipment used to do so associated with fueling stations.

Q22 What types of food are available at your fueling station(s)? (check all that apply)

- Energy Bars (1)
Energy Shakes (2)
Protein Bars (3)
Protein Shakes (4)
Bagels (5)
Hot and/or Cold Cereals (6)
Granola (7)
Sandwiches (8)
Hot Meals (9)
Soup (10)
Snack Foods (i.e. Potato chips, pretzels, goldfish) (11)
Trail Mix (12)
Milk (1%) (13)
Low Fat Chocolate Milk (14)
Yogurt (15)
Cheese (16)
Nuts (17)
Nut Spreads (18)
Hummus (19)
Fresh Vegetables (20)
Salads (21)
Fresh Fruit (22)
Dried Fruit (23)
Juice (24)
Smoothies (26)
Other (25) ____________________

Q23 Who determined what foods would be served in your school's fueling stations?

- Registered Dietitian (1)
- Strength and Conditioning Coach (2)
- Athletic Trainer (3)
- Athletic Director (4)
- Head Coach (5)
- Assistant Coach (6)
- Team Doctor (7)
- Other (8) ____________________
Q24 What percent of the total fueling station budget is used for food cost?

- 20% (1)
- 40% (2)
- 60% (3)
- 80% (4)
- Unknown (5)

Q25 How much has been spent on equipment?

- $0-$24,999 (1)
- $25,000-$74,999 (2)
- $75,000-$124,999 (3)
- >$125,000 (4)
- Decline to answer (5)
- Unknown (6)

Q26 What equipment was needed in the development of your fueling station(s)? (check all that apply)

- Large double door fridge (1)
- Under counter fridge (2)
- Microwave (3)
- Toaster (4)
- Blender (5)
- Hot water spigot installed in the sink (6)
- Sport beverage/Water dispenser (7)
- Oven (8)
- Hot Plates (9)
- Stove top (10)
- Warming box (11)
- Vending Machine (12)
- Other (13) ________________
Q27 Did your school build, add on, or renovate in response to the changes in regulations?
Yes (1)
No (2)

Q28 The following section contains questions pertaining to who has access to fueling stations and their ability to do so.

Q29 How many hours per day on average is your fueling station(s) accessible?
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)
- 11 (11)
- 12 (12)
- 13 (13)
- 14 (14)
- 15 (15)
- 16 (16)
- 17 (17)
- 18 (18)
- 19 (19)
- 20 (20)
- 21 (21)
- 22 (22)
- 23 (23)
- 24 (24)
Q30 How many student athletes have access to fueling station(s)?

- (1)
- 100-199 (2)
- 200-299 (3)
- 300-399 (4)
- 400-499 (5)
- >500 (6)

Q31 Do all student-athletes have access to fueling stations?

- Yes (1)
- No (2)

If Yes Is Selected, Then Skip To Is there a system in place to prescri...
Q32 Which teams do NOT have access to fueling station(s)? (check all that apply)

- Football (1)
- Basketball (2)
- Baseball (3)
- Soccer (4)
- Swimming (5)
- Gymnastics (6)
- Golf (7)
- Hockey (8)
- Lacrosse (9)
- Fencing (10)
- Volleyball (11)
- Rowing (12)
- Tennis (13)
- Track (14)
- Other (15) ____________________
- Lacrosse (16)
- Basketball (17)
- Softball (18)
- Soccer (19)
- Swimming (20)
- Gymnastics (21)
- Golf (22)
- Field Hockey (23)
- Tennis (24)
- Track (28)
- Volleyball (25)
- Water Polo (26)
- Other (27) ____________________
- Bowling (29)
- Other (30) ____________________

Q33 Is there a system in place to prescribe diets to athletes which are executed through fueling stations? i.e. higher number of grams of carbohydrates for endurance athletes

- Yes (1)
- No (2)
Q34 Is there a system in place to limit what, when, or how much food a student-athlete can receive from a fueling station?

- Yes (1)
- No (2)

Answer: If Is there a system in place to limit what, when, or how much a student-athlete can receive from a... Yes Is Selected

Q35 Please describe the system that your college or university has in place to limit what, when, or how much a student-athlete can receive from a fueling station.

Q36 The following section contains demographic related questions.

Q37 What is your current age?
Q 20 (1)
Q 21 (2)
Q 22 (3)
Q 23 (4)
Q 24 (5)
Q 25 (6)
Q 26 (7)
Q 27 (8)
Q 28 (9)
Q 29 (10)
Q 30 (11)
Q 31 (12)
Q 32 (13)
Q 33 (14)
Q 34 (15)
Q 35 (16)
Q 36 (17)
Q 37 (18)
Q 38 (19)
Q 39 (20)
Q 40 (21)
Q 41 (22)
Q 42 (23)
Q 43 (24)
Q 44 (25)
Q 45 (26)
Q 46 (27)
Q 47 (28)
Q 48 (29)
Q 49 (30)
Q 50 (31)
Q 51 (32)
Q 52 (33)
Q 53 (34)
Q 54 (35)
Q 55 (36)
Q 56 (37)
Q 57 (38)
Q38 What gender do you identify as?
○ Male (1)
○ Female (2)

Q39 Job Title or Position
☐ Registered Dietitian (1)
☐ Registered Dietitian (CSSD) (2)
☐ Athletic Trainer (3)
☐ Strength and Conditioning Specialist (4)
☐ Athletic Director/Administrator (5)
☐ Other (6) ____________________
Q40 How many years have you been working in your current position?

☐ (1)
☐ 1 (2)
☐ 2 (3)
☐ 3 (4)
☐ 4 (5)
☐ 5 (6)
☐ 6 (7)
☐ 7 (8)
☐ 8 (9)
☐ 9 (10)
☐ 10 (11)
☐ 11 (12)
☐ 12 (13)
☐ 13 (14)
☐ 14 (15)
☐ 15 (16)
☐ 16 (17)
☐ 17 (18)
☐ 18 (19)
☐ 19 (20)
☐ 20 (21)

Q55 In which state is your school located?

☐ Alabama (1)
☐ Alaska (2)
☐ Arizona (3)
☐ Arkansas (4)
☐ California (5)
☐ Colorado (6)
☐ Connecticut (7)
☐ Delaware (8)
☐ Florida (9)
☐ Georgia (10)
☐ Hawaii (11)
☐ Idaho (12)
☐ Illinois (13)
Indiana (14)
Iowa (15)
Kansas (16)
Kentucky (17)
Louisiana (18)
Maine (19)
Maryland (20)
Massachusetts (21)
Michigan (22)
Minnesota (23)
Mississippi (24)
Missouri (25)
Montana (26)
Nebraska (27)
Nevada (28)
New Hampshire (29)
New Jersey (30)
New Mexico (31)
New York (32)
North Carolina (33)
North Dakota (34)
Ohio (35)
Oklahoma (36)
Oregon (37)
Pennsylvania (38)
Rhode Island (39)
South Carolina (40)
South Dakota (41)
Tennessee (42)
Texas (43)
Utah (44)
Vermont (45)
Virginia (46)
Washington (47)
West Virginia (48)
Wisconsin (49)
Wyoming (50)
RECRUITMENT LETTERS

Dear Prospective Participant:

My name is Ellsworth Smith and I am currently a graduate student in Nutrition at Kent State University. I am currently conducting a descriptive study to gather information regarding the response to the deregulation of feeding student-athletes at NCAA affiliated colleges and universities, specifically the development of fueling stations.

You are receiving this email because you are a member of the Collegiate Strength and Conditioning Coaches Association or are listed on your college or university’s athletic staff roster as an athletic trainer or strength and conditioning coach.

I am looking for participants who are currently employed by a Division I or Division II NCAA affiliated college or university and are involved enough with the nutrition support of student-athletes that they will be able to answer questions regarding the details of their school’s fueling station, if they have one, in relation to labor, operation, student-athlete access, food, equipment, and general information regarding the college or university.

If you are currently employed at a Division I or Division II college or university with a fueling station, but do not have the required information to complete the survey please forward this email to an individual who does have the information.

Attached below is a link to the survey. Participation is voluntary and completion of the survey should take approximately 10 minutes.
If you have any questions regarding this survey or request to participate please do not hesitate to contact myself at esmith99@kent.edu or Dr. Amy Miracle at amiracle@kent.edu.

Very Respectfully,

Ellsworth Smith

Dietetic Intern

Graduate Student

Kent State University
Dear Prospective Participant:

My name is Ellsworth Smith and I am currently a graduate student in Nutrition at Kent State University. I am currently conducting a descriptive study to gather information regarding the response to the deregulation of feeding student-athletes at NCAA affiliated colleges and universities, specifically the development of fueling stations.

You are receiving this email because you are a member of the Collegiate and Professional Sports Dietitians Association.

I am looking for participants who are currently employed by a Division I or Division II NCAA affiliated college or university and are involved enough with the nutrition support of student-athletes that they will be able to answer questions regarding the details of their school’s fueling station, if they have one, in relation to labor, operation, student-athlete access, food, equipment, and general information regarding the college or university.

If you are currently employed at a Division I or Division II college or university with a fueling station, but do not have the required information to complete the survey please forward this email to an individual who does have the information.

Attached below is a link to the survey. Participation is voluntary and completion of the survey should take approximately 10 minutes.
https://kent.qualtrics.com/SE/?SID=SV_2bqpl5uTPflECc5

If you have any questions regarding this survey or request to participate please do not hesitate to contact myself at esmith99@kent.edu or Dr. Amy Miracle at amiracle@kent.edu.

Very Respectfully,

Ellsworth Smith

Dietetic Intern

Graduate Student

Kent State University
APPENDIX C

CONSENT FORM
The purpose of this descriptive study is to determine the response of affiliated Division I and II colleges and universities to the National Collegiate Athletic Association’s deregulation of feeding players in relation to nutrition support, specifically fueling stations. Participation in the study typically takes 10 minutes and is strictly anonymous. Participants will be asked to answer a number of questions regarding the development and operation of fueling stations.

All responses are treated as confidential, and in no case will responses from individual participants be identified. Rather, all data will be pooled and published in aggregate form only. Participants should be aware, however, that the experiment is not being run from a "secure" https server of the kind typically used to handle credit card transactions, so there is a small possibility that responses could be viewed by unauthorized third parties (e.g., computer hackers).

Participation is voluntary, refusal to take part in the study involves no penalty or loss of benefits to which participants are otherwise entitled, and participants may withdraw from the study at any time without penalty or loss of benefits to which they are otherwise entitled.

If you have any questions or concerns about this research, you may contact Professor Amy Miracle, at amiracle@kent.edu; or the Kent State University Institutional Review Board, at (330) 672-2704. This project has been approved by the Kent State University Institutional Review Board. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330.672.2704.

If you are 18 years of age or older, understand the statements above, and freely consent to participate in the study, click on the "I Agree" button to begin the experiment.
APPENDIX D

FILL IN SURVEY RESPONSES
FILL IN SURVEY RESPONSES

How would you describe the serving format of your fueling station(s)? (check all that apply)-Other

locker rooms & Strength and conditioning rooms

Locker Room Team Lounges

Open use w/in locker rooms

grab n go main location and in each locker room

Meals after Practice (MAPs)

refrigerated choc milk

Locker room area

locker room fueling station

Purchase from warehouse club

Weight Room

Locker rooms

Weight room nutrition station

Performance Training Center

Recovery stations in weight room

fueling station

Out of 4 weightrooms, athletes are given pb&j’s as well as other snack foods
What jobs have been created as a direct result of the deregulation? (check all that apply)-Other

Caterers
Dining Hall Staff
Sports Nutrition Fellow
part time nutrition student
Nutritionist
What types of food are available at your fueling station(s)? (check all that apply)-Other

squeezable fruit

Small sandwiches

Unknown. Awaiting reply from donor vendor

Bread, Peanut Butter, Jelly,

cherry juice, beet elite (certain teams), naked juice, fruit cups

Honey Stinger Waffles and Gummies

Water, Gatorade

uncrustables, beef jerky

Hard boiled eggs, CheriBundi

Eggs, pita bread, shredded chicken, tuna salad, guacamole

pickles, jerky

Additional items will become available in phase II of project

beef jerky, almond/soy milks, condiments

Fruit Pouches

Apple Sauce

beef jerky

full breakfast

Peanut Butter, Jelly, & Assorted Loaves of Bread
Who determined what foods would be served in your school's fueling stations?

Athletic Trainer & Strength & Conditioning Coach together & Strength Coach
Cafeteria staff
Administration & Sports Performance
combination of Strength and ATC
Director of Ops
strength, at staff, dining staff
Committee - S&C, ATC, Dietitian
AT, Strength Coach, coach, RD team approach
Strength Staff
Outside Corporation
What equipment was needed in the development of your fueling station(s)? (check all that apply)-Other

Cafeteria has expanded and restructured the entire format of the meals.

Freezer
Table
Food storage racks
Milk dispenser
Milk machine
ice machine
cabinets
Food containers
storage cabinet
Counter organization units
Shelving Rack/Stand
Locked Storage
Mobile countertops with storage, mini fridges, serving bowls, laptop
Taylor machines (smoothies)
dishwasher, ice machine
additional items being worked on currently
Counter space, storage cabinets, bins to store ready available food
Water cooler with hot water and boiling water setting
Snack Tray/storage
dish washer, cook wear and serving pieces
they were all already in place

payment machine, scans id cards
Please describe the system that your college or university has in place to limit what, when, or how much student athletes can get from fueling stations.

Very specific times that students can access fueling station. Times are available a few hours prior to practices/games and immediately post practices/games. Additional access is granted by specific need as deemed appropriate by athletic training staff and dietitian.

UNDER DIRECTION OF STRENGTH AND CONDITIONING COACH

Basically, we have sheets that regulate what products which athletes can take.

Limit on items per day

Depends on sport, but usually 1 bar, 1 jerky or nuts, 1 shake. Some teams get smoothies

We only allow student athletes to access the fueling station immediately before and after practices. They are required to list foods taken on Ipads that are available throughout the station. They are also monitored by our Registered Dietitian.

Strength Coach watches the fridge and food in the weight room and monitors who and how much is being taken.

strength and conditioning coach distributes fueling items or AT

After weight lifting or other training stations. Some teams provide snacks after practices.

depends on class schedule and practice/training sessions

When we have student athletes up here we place a work-study student over there to make sure nobody is getting too much in our opinion. No need to take 24 oz of milk when you dont need it. Things like that we try to regulate as best as we can.

Outside of weight room, designed for immediately post-lift

Grab n Go has a item number limit; locker room fueling stations do not have limits and are unmanned

Dietitian/strength coach prescribed snack options. Intern tracks what is given to whom and schedules meetings w dietitian
The Coach decides how much each student-athlete is allowed to use because once the supply runs out the station is done.

eat SA is permitted three pieces of fruit and three bars per week

limit what is put out after training groups and 1v1 console

team by team

With regards to Chocolate milk and or NCAA Compliant protein shakes, we limit them to post workout only for the majority of our student-athletes. There are some that are on a "high priority weight gain" list that are allowed additional shakes per day with a set limit. The post workout recovery drink station is different from that of the "grab and go" station that is available from 7:00 am to 10:00 am. We allow all student-athletes (not on "high priority weight gain") to use the blenders, cups, and milk to make their own shakes if they would like to at any point in time of the day so long as they provide their own protein powder. Budget is the issue...

The fueling station is located in the weight-room, so athletes grab their snacks for the day post-training.

2 different grab n go snacks per day. Protein Powder everyday. Ready to drink shakes or protein bar post lift sessions.

Strength coach determines when and how much student athletes can access the station.

Limit on amount per day

One day, Wednesday from 7-9pm. Usually a sub from Firehouse Subs, dried fruit/raisins, trail mix, water and Gatorade.

We use a laptop with an excel spreadsheet where the student-athletes input a tally (in this case a number) under whatever item they take. This tracks both inventory and who has been using the refueling station. The spreadsheet is renewed each day. We have two tables available, a "refrigerated side" and a dry side and students make take one item from each side of the table (for example, a greek yogurt + a bag of trailmix)

Certain items are allocated limits on the amount allowed to be given per athlete; athletes are allowed to use the refueling station once per day maximum at this time

Two points per athlete per day. Food is labeled with points per budget numbers to control cost. \Other fueling stations, with teams with higher budgets (revenue
producing sports) have more open ended fueling stations, and there is very few limits on the food, besides how much we put out.

Determined by RD and SC who needs what related to time in season and body comp goals.

Talk/educate/inform.

limit juices to one bottle a day and certain juices are only available certain days a week.

one bar per day

Currently we use punch cards in the football fueling station. Each item offered is 1 punch. Recovery shakes are free and they are allowed one "free" pre-workout snack. This will extend to all athletes once we complete construction on the new fueling station.

Supervised taking of the food available.

3 snacks a day

Athletes can only use fueling station post workout and choose from energy bars or refueling drink

student monitor, 1 sandwich, limited grab and go items

This is still in the works and will be finalized once a full time dietitian is hired.

dependent upon how many times athlete workouts daily

Chocolate milk post lift, choice of 1 snack item and 1 piece of fruit after all lifting sessions, also can be used at the discretion of the s and c staff (missed breakfast, skipped lunch)

No more than two packaged items during each visit.

The fueling station is grab and go box meals. Staff member checks off of student athlete list who has picked up a meal. They are limited to one.

interns working most stations

We limit them on the number of items they get per day.
Access is limited to 90min before and after their practice time block. They are allowed 3 items per visit - this is monitored by Fuel Zone staff or volunteer, otherwise honor system.

2 snacks per day during hours the weight room is open. The snacks are kept locked.

3 items 90 minute pre and post an active practice - SA have access via ID

They are allowed to take a certain number of items at one time.

Pre-exercise refueling items, post exercise refueling items.

S&C interns are directed by s&c coaches on who can have what and how much.

Clerk ensures athletes are not "shopping" at the fueling station.
Job Title or Position-Other

Assistant Athletic Director for Sports Performance

Director of Sports Performance
APPENDIX E

PARTICIPANT STATE OF INSTITUTION RESULTS
### PARTICIPANT STATE OF INSTITUTION RESULTS

*Results of what state the participant’s institution is located*

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*Note.*
APPENDIX F

CONFERENCE BUDGET INCREASES
CONFERENCE BUDGET INCREASES

*Budget increases for nutrition support after deregulation separated by conference*

| Conference                                | $0-$49,999 | $50,000-$99,999 | $100,000-$149,999 | $150,000-$199,999 | $200,000-$249,999 | $250,000-$299,999 | $300,000-$349,999 | $350,000-$399,999 | $400,000-$449,999 | $450,000-$499,999 | $500,000-$549,999 | $550,000-$599,999 | $600,000-$649,999 | $650,000-$699,999 | $700,000-$749,999 | $750,000-$799,999 | $800,000-$849,999 | $850,000-$899,999 | $900,000-$949,999 | $950,000-$999,999 | $1,000,000-$1,199,999 | $1,200,000-$1,499,999 | $1,500,000-$1,699,999 | $1,700,000-$1,899,999 | $1,900,000-$1,999,999 | or more | Declined | Unknown |
|-------------------------------------------|------------|-----------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Division I                                |            |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| American Athletic C.                      | 3          | 1               | 2                 | 1                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Atlantic Coast C.                         | 2          | 2               |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Big Ten                                  | -          | 1               | 1                 | 1                 | 3                 | 2                 | 2                 | 3                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Big 12                                   | -          | 1               |                   |                   |                   |                   |                   |                   | 2                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Conference USA                           | 2          |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Mid-American C.                           | 5          | 2               | 1                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Mountain West C.                          | 2          | 2               | 1                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Southeastern C.                           | -          | 1               | 1                 | 1                 | 2                 | 2                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Sun Belt C.                               | 3          | 1               |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Big Sky C.                                | 2          | 1               |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Big South C.                              | -          | 2               |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Colonial A.A.                             | 3          | 2               |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Ivy League                               | 1          |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Mid-Eastern Athletic C.                   | -          |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Missouri Valley Football C.               | 3          | 2               |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Ohio Valley C.                            | 1          |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Patriot League                           | 2          |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Southern C.                               | -          |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Southland C.                              | 1          |                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| Other                                     | 15         | 2               | 3                 |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |                   |

Note. “C.” is an abbreviation for conference.

Note. “A.A.” is an abbreviation for athletic association.
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