March 2024

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Recommended Citation

Ryan, Michael; Borgerding, Rosemary E.; and Oliver, Kimberly L. (2024) "A Nutritional Intervention to Improve Body Composition in Adolescent Athletes," *Journal of Athlete Development and Experience*: Vol. 6: Iss. 1, Article 3.  
Available at: https://scholarworks.bgsu.edu/jade/vol6/iss1/3

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A Nutritional Intervention to Improve Body Composition in Adolescent Athletes

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A B S T R A C T

This study assessed the effectiveness of a sports nutrition intervention designed to improve body composition in 25 high-school male athletes over a 12-week period. Employing a mixed-methods approach within a quasi-experimental one-group pretest-postest design, the intervention integrated nutrition education with the provision of food. Quantitative results revealed significant reductions in body fat percentage and fat mass, and an increase in fat-free mass. Qualitative insights highlighted the untapped nutritional potential of adolescents and emphasized the importance of accessibility and simplicity in driving compliance. The findings suggest that targeted nutritional interventions can positively impact adolescent athletes' body composition. The study underscores the need for practical approaches to nutritional guidance that resonate with youth, offering valuable insights for sports professionals, coaches, and parents.

Keywords: adolescent athletes, body composition, high school athletes, sport nutrition

Introduction

Nutrition can be defined as the process of taking in food and using it for growth, metabolism, and repair (MedicineNet, 2021). Conversely, malnutrition refers to deficiencies, excesses, or imbalances in a person’s intake of energy and/or nutrients (World Health Organization, 2020). The importance of adequate nutrition cannot be overstated, especially during adolescence, a critical period of physical and mental development (World Health Organization, 2005). The demands of this phase are amplified in adolescent athletes, who engage in regular and intense physical activity (Petrie et al., 2004). Data suggest that body composition, which can be influenced by food intake (Cameron et al., 2016; Costa et al., 2018), might play a role in adolescent athletes' risk of injury (McHugh et al., 2006; Richmond et al., 2013; Thralls et al., 2016; Yard & Comstock, 2011). This highlights the importance for sport professionals to consider adolescent athletes' food intake and body composition when aiming to address their overall development and safety. Current literature on effective nutritional interventions for adolescent athletes remains inconclusive (Bentley et al., 2020; Boidin et al., 2021; Sánchez-Díaz et al., 2020). Hence, there is a need to elucidate strategies that can influence adolescent athletes' food intake, which in turn can positively impact their body composition and overall health. This study aims to evaluate the feasibility of a sports nutrition intervention with a focus on improving athletes' body composition. Drawing inspiration from a hydration intervention in adolescent athletes (Cleary et al., 2012), our approach integrates the provision of appropriate food choices for athletes along with explicit dietary prescription. With this research, we aspire to shed light on effective strategies to improve adolescent athletes' nutrition and body composition, which could contribute to their overall development and promote safer sports participation.

Literature Review

The Complexity of Dietary Interventions in Adolescents

Changing dietary habits, particularly in adolescents, is a multifaceted challenge influenced by myriad factors including socioeconomic status, cultural preferences, psychological factors, and the availability of food (Story et al., 2002). Adolescence is a critical period marked by rapid growth and development, during which nutritional needs are heightened (Das et al., 2017). This phase also sees the emergence of autonomous food choices and dietary patterns that may not meet the
nutritional requirements for an adolescent’s development (Treitle et al., 2023; Ziegler et al., 2021). The physiological changes and evolving social dynamics characteristic of adolescence highlight the complexity involved in designing effective dietary interventions for this demographic.

**Mixed Outcomes of Educational Nutritional Interventions**

Educational interventions aimed at improving adolescent nutrition have been widely implemented, with varying degrees of success (Meiklejohn et al., 2016). While some studies report improvements in knowledge and dietary behaviors (Van Cauwenberghe et al., 2010), others suggest that education alone may not be sufficient to induce significant changes in eating habits (Capper et al., 2022). The mixed effects of educational interventions underscore the complexity of changing behavior, particularly in a population that is still developing decision-making skills and is influenced by parental choices, peer dynamics and marketing (Ha et al., 2022).

**The Role of the Food Environment**

Recent research has begun to explore the impact of the food environment on adolescent dietary behaviors (Downs & Demmier, 2020). The availability and accessibility of healthy food options has been shown to influence dietary choices (Hawkes et al., 2020). Interventions that modify the food environment, providing healthier options while limiting less nutritious alternatives, demonstrate potential in promoting healthy eating habits (Story et al., 2008).

**Integrating Education with Environmental Changes**

Building on the premise that environmental changes can complement educational efforts, there is emerging evidence that interventions combining both elements can be more effective. For example, a hydration intervention in adolescent athletes that provided water while also prescribing water breaks and intake targets resulted in improved hydration status (Cleary et al., 2012). This integrated approach, combining education with environmental modifications, could potentially be applied to food intake, suggesting a promising direction for future interventions.

**Research Gap**

Given the importance of nutrition in adolescent athletes and the potential for combined educational and environmental interventions to effect change, this study seeks to fill a gap in the literature. By providing food options alongside nutritional education, the intervention aims to create a supportive environment that encourages healthier eating behaviors, addressing both the knowledge and accessibility aspects of adolescent nutrition.

**Method**

**Study Design**

This study employed a mixed methods approach within a quasi-experimental one group pretest-posttest design (Creswell & Guetterman, 2018; Privitera & Ahlgrim-Delzell, 2018). This design was chosen due to the opportunity to work closely with a single high school sports program and the desire to capture both quantitative changes in body composition and qualitative insights into athletes' experiences and perceptions. This approach allowed us to assess the impact of our intervention within the context of a typical public high school sports program, while also gaining a deeper understanding of the athletes' perspectives. In this design, the quantitative component involved pre- and post-intervention measurements of height (Charder, 2007), weight (Tanita, 2020), and body fat percentage (Tanita, 2020). Weight and body fat percentage were used to calculate each athlete's fat mass and fat-free mass, providing a quantitative assessment of the impact of the nutritional intervention on the athletes' body composition. This allowed us to assess the effectiveness of the intervention in improving body composition among adolescent athletes.

The qualitative component involved the use of questionnaires, conversational interviews, and researcher field note observations (Boynton & Greenhalgh, 2004; Creswell & Guetterman, 2018;
Oliver, 1998). These data provided insight into the athletes' experiences and perceptions of the intervention, providing a more comprehensive understanding of its impact. The integration of these methods allowed us to not only assess the effect of the intervention on athletes' body composition, but also to understand how the intervention was received by the athletes and evaluate the feasibility of implementing such an intervention with a high school sports program.

**Setting**

The study was conducted at a public high school, with data collection integrated into the athletes' regular weekly practice schedule. The study spanned a period of 12 weeks, beginning in the pre-season and concluding during the in-season period.

**Participants**

The participants consisted of 25 male student athletes from a high school basketball program, with a mean age of 15.46 years (SD = 1.03).

**Variables**

The independent variable was a nutrition intervention. This intervention included discussions with athletes regarding their current eating habits, nutrition education, individualized prescriptions, and food availability before and after training sessions and competitions. The dependent variables were components of the athletes' body composition, specifically body fat percentage, fat-free mass, and fat mass. Body fat percentage and weight were measured using a bioelectrical impedance device (Tanita, 2020), and these measurements were used to calculate fat-free mass and fat mass.

**Data Collection**

Data were collected through a combination of methods to assess the athletes' experiences and changes in body composition. Questionnaires, observations, and conversational interviews were conducted to explore the athletes' eating habits, their experiences with the intervention, and their perceptions of its impact (Boynton & Greenhalgh, 2004; Creswell & Guetterman, 2018; Oliver, 1998). Additionally, bioelectrical impedance analysis was performed to measure the body composition of athletes both before and after the intervention (Tanita, 2020). This assessment included measurements of athletes' age, height (Charder, 2007), weight (Tanita, 2020), body fat percentage (Tanita, 2020), fat mass, and fat free mass.

**Procedure**

First, athletes' age, height (Charder, 2007), weight (Tanita, 2020), and body fat percentage (Tanita, 2020) were gathered. From these data, additional calculations were made to determine each athlete's fat free mass and fat mass. Next, athletes completed a questionnaire about their current eating habits (see Appendix A for the specific questions). The athletes' answers to these questions confirmed the need for a nutrition intervention aimed at improving their food intake. Our team provided athletes with food items including milk, apples, bananas, oranges, mandarins, peanut butter, and string cheese on a weekly basis, before and after sport practice (see Appendix B for exact ingredients and food composition). Athletes who sought nutrition guidance were given individual prescriptions of what and when to eat based on their body composition and their desired outcomes. These prescriptions were developed in collaboration with the athletes, taking into account their willingness to make dietary changes, to ensure the recommendations were realistic and achievable. On four separate occasions, either prior to or after sport competition, our team provided athletes with one of two meals. One meal was composed of four ounces of chicken, 150 grams of rice, and two ounces of avocado. The other meal consisted of four ounces of ground beef (90% lean/10% fat) mixed with one ounce of cheddar cheese and 150 grams of rice (see Appendix B for exact ingredients and meal composition). These selections were informed by our initial
assessment, which revealed several nutritional gaps among the athletes. Notably, many were not meeting the recommended intake levels of 1.2–2.0 grams per kilogram of body weight per day for protein and 20%–35% of total energy intake from fat (Thomas et al., 2016). Furthermore, a substantial proportion reported skipping meals either before or after their training sessions. Additionally, our analysis suggested a potential deficiency in their fruit and vegetable consumption (Lange et al., 2021).

Throughout the study, we conducted conversational interviews with the athletes to gather their feedback (Oliver, 1998). These interviews were analyzed in real-time, allowing us to adjust the intervention based on the athletes' feedback and experiences. Specifically, we sought to understand their perspectives on the food provided — whether they found them enjoyable or useful, and if they wished for the provision of food to continue. This iterative process of data collection and analysis ensured that our intervention was responsive to the needs and experiences of the athletes (Oliver, 1998).

Data Analysis

In our data analysis, we used one-tailed paired t-tests to assess if there were statistically significant differences in athletes' body fat percentage, fat mass, and fat-free mass following the intervention. Since no athletes were identified with a body fat percentage below a healthy range at the outset, we were able to form directionally-focused hypotheses. Specifically, we predicted that the intervention would lead to reductions in both body fat percentage and fat mass and an increase in fat-free mass. The specific directional nature of our hypotheses justified the use of a one-tailed test (Ludbrook, 2013). For the t-tests, alpha was set to .05. In addition to the t-tests, we also calculated Cohen's d to measure the effect size for each variable. All statistical analyses were performed using IBM SPSS statistics software version 27 (IBM Corp., 2020). For the qualitative analysis, we began by evaluating athletes' responses to an initial questionnaire about their eating habits (Boynton & Greenhalgh, 2004; see Appendix A for the specific questions). This assessment allowed us to evaluate athletes' meal frequency, meal timing, and estimate their typical macronutrient intake. For the conversational interviews and field note observations, data were transcribed, anonymized, and coded for thematic analysis (Creswell & Guetterman, 2018). This qualitative analysis was conducted concurrently with the intervention, allowing us to make real-time adjustments based on the athletes' feedback and experiences (Almirall & Chronis-Tuscano, 2016).

Ethical Considerations

This research was conducted in accordance with ethical guidelines and was approved by both an Institutional Review Board and the relevant School District. Informed written consent was obtained from the parents of the participants, and informed written assent was obtained from the participants themselves. All data were anonymized to maintain participant confidentiality.

Results

This section presents the findings from the mixed methods approach employed in this study to investigate the impact of a 12-week nutrition intervention program on athletes' body composition and their experiences with the intervention. The quantitative results include descriptive and inferential statistics related to the athletes' body fat percentages, fat mass, fat-free mass, as well as changes in their weight and height from pre- to post-intervention. The qualitative results shed light on the athletes' experiences and perceptions of the nutrition intervention, highlighting key themes that emerged from their responses. Together, these findings provide a comprehensive understanding of the impact of the nutrition intervention on the athletes' body composition and their experiences with the intervention.
Descriptive Statistics

The athletes in this study were part of a 12-week nutrition intervention program. Over the course of the intervention, there was a slight increase in the athletes' average height and weight. In terms of body composition, there was a small decrease in average body fat percentage from pre- to post-intervention. This was accompanied by a decrease in average fat mass and an increase in average fat-free mass. Detailed descriptive statistics for these measures at the start and end of the intervention are presented in Table 1. The next section will delve into the inferential statistics to examine whether these changes were statistically significant.

Table 1
Descriptive Statistics for Pre- and Post-Intervention Measurements

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre-Test (M ± SD)</th>
<th>Post-Test (M ± SD)</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>15.46 ± 1.03</td>
<td>15.69 ± 1.03</td>
<td>+ .23</td>
</tr>
<tr>
<td>Height (inches)</td>
<td>67.98 ± 3.04</td>
<td>68.53 ± 2.95</td>
<td>+ .55</td>
</tr>
<tr>
<td>Weight (lbs)</td>
<td>150.2 ± 38.26</td>
<td>151.31 ± 37.06</td>
<td>+ 1.11</td>
</tr>
<tr>
<td>Body Fat Percentage (%)</td>
<td>.20 ± .06</td>
<td>.19 ± .06</td>
<td>-.01</td>
</tr>
<tr>
<td>Fat Free Mass (lbs)</td>
<td>118.67 ± 23.09</td>
<td>120.58 ± 22.13</td>
<td>+ 1.91</td>
</tr>
<tr>
<td>Fat Mass (lbs)</td>
<td>31.53 ± 17.46</td>
<td>30.73 ± 17.78</td>
<td>- .80</td>
</tr>
</tbody>
</table>

Inferential Statistics

One-tailed paired-samples t-tests were conducted to compare body fat percentage, fat mass, and fat-free mass pre- and post-intervention. There was a significant decrease in body fat percentage from pre- to post-intervention (t(24) = -3.02, p = .003). The effect size for this analysis (d = .60) indicated a medium effect. Similarly, there was a significant decrease in fat mass (t(24) = -1.81, p = .04) with a small effect size (d = .36). Fat-free mass significantly increased from pre- to post-intervention (t(24) = 2.89, p = .004) with a medium effect size (d = .58). These inferential statistics, including t-values, p-values, and effect sizes, are presented in Table 2.

Table 2
Inferential Statistics for Pre- and Post-Intervention Measurements

<table>
<thead>
<tr>
<th>Measure</th>
<th>t(24)</th>
<th>p (one-sided)</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Fat Percentage (%)</td>
<td>- 3.02</td>
<td>.003</td>
<td>.60</td>
</tr>
<tr>
<td>Fat Mass (lbs)</td>
<td>- 1.81</td>
<td>.04</td>
<td>.36</td>
</tr>
<tr>
<td>Fat Free Mass (lbs)</td>
<td>2.89</td>
<td>.004</td>
<td>.58</td>
</tr>
</tbody>
</table>

Insights from Questionnaires, Observations, and Interviews

Through the administration of questionnaires, researcher observations, and conversational interviews, we delved into the athletes’ eating habits, their nutrition knowledge, and their perceptions of the nutrition intervention. From these data, two distinct themes emerged, shedding light on the untapped nutritional potential of the athletes and the factors that contributed to their compliance with the intervention.

Untapped Nutritional Potential

Findings from the initial questionnaire revealed a significant gap in the athletes' nutritional habits and their understanding of proper nutrition. A striking 69% of athletes reported not eating breakfast, and the majority were found to be undereating prior to afternoon sport practices. The choices they made were often far from ideal for supporting their physical activity or development.
For example, athletes revealed that their only food for the day prior to practice might be, "a bag of chips," "gushers," or "a candy bar." These data not only highlighted the inadequacy of their current eating habits but also pointed to a lack of awareness and education about proper nutrition. Conversational interviews with athletes further underscored this lack of knowledge. One athlete expressed uncertainty about what changes could be made to eat better, stating, “I’m not sure how to improve my eating. Maybe like eat a salad from McDonald’s.” Another athlete's comment, “I just eat what’s around. If my friends go to eat, I go with them and it’s whatever,” revealed how athletes' eating choices often were influenced by their surroundings rather than an understanding of nutritional needs. Together, these findings painted a picture of untapped nutritional potential among the athletes. They were not eating in ways that supported their physical activity or development, and there was a clear opportunity for improvement. The lack of knowledge about proper nutrition and the influence of their social environment on their eating choices indicated that a targeted intervention could have a significant impact. This theme set the stage for the intervention, highlighting the need for both education and practical support to help athletes make better nutritional choices.

**Accessibility and Simplicity Drive Compliance**

The second theme that emerged from these data was the critical role of accessibility and simplicity in driving compliance with the nutrition intervention. By making nutritious food readily available to athletes and educating them on why those food choices were beneficial for their health and performance, the intervention put them in a position where making healthier choices was both simple and accessible. The athletes' responses were overwhelmingly positive about the availability of food. One athlete noted, “This makes it so I can eat better.” Another commented, “Now I have options that are better than before.” The convenience of having healthy options like fruit in the locker room was also appreciated, with one athlete saying, "I usually wouldn't eat that stuff (fruit), but since it's in the locker room, I'm like ok, I'll have that." The sentiment was summed up by another athlete who stated, "You just made it easy for us to make that choice, and it was simple." These responses highlight the importance of not only providing education about nutrition but also creating an environment where making healthier choices is convenient and uncomplicated. The combination of accessibility and simplicity appeared to be key in encouraging the athletes to adopt better eating habits, reflecting a practical approach to nutritional guidance that resonated with this particular group.

**Summary of Key Findings**

In summary, the mixed methods approach of this study has yielded insightful findings on the impact of the 12-week nutrition intervention on adolescent athletes. The quantitative analysis revealed changes in body composition, including a decrease in body fat percentage and fat mass, and an increase in fat-free mass. These changes were statistically significant and indicate a positive effect of the intervention on body composition. The qualitative data uncovered two vital themes: the untapped nutritional potential of the athletes and the crucial role of accessibility and simplicity in driving compliance with the intervention. The athletes' lack of awareness and the influence of their social environment on eating choices were identified as areas for improvement, while the convenience and simplicity of the intervention were praised. Together, these findings provide a multifaceted view of the intervention's impact, setting the stage for a nuanced discussion of the implications, limitations, and future directions in the subsequent section.
Discussion

This research aimed to investigate the feasibility of a sport nutrition intervention targeted at improving adolescent athletes' body composition. The mixed methods approach revealed significant changes in body composition and provided insights into the athletes' perceptions of the intervention. The following sections will delve into the interpretation of these findings, discuss their broader implications, acknowledge the study's limitations, and suggest directions for future research.

Improving adolescent athletes' nutrition and body composition is important for their development and may also play a role in reducing their risk of injury (McHugh et al., 2006; Richmond et al., 2013; Thralls et al., 2016; World Health Organization, 2005; Yard & Comstock, 2011). Although the focus of this study was on athletes, the health implications of nutrition and body composition are seen far beyond sport (Lytle & Rubik, 2003; Ruiz et al., 2009). The mean body fat percentage of our sample at the start of the intervention was 20%, notably higher than the reference value of 13% for adolescents of similar age and height (Hergenroeder & Klish, 1990). This discrepancy may reflect the observed trend of increasing weight among adolescents since 1990 (Sanyaolu et al., 2019; Wang et al., 2020), a concern that extends to all adolescents, not just those engaged in sports. This trend underscores the growing concern over weight-related health risks in adolescence (Jebeile et al., 2022) and emphasizes the need for nutritional guidance. The success of the intervention in improving body composition highlights the importance of combining nutrition education with the provision of healthy food options. This approach is consistent with existing research highlighting the influence of peer groups, family, and school food environments on adolescent nutrition (Gubbels, 2020; Ragelienė & Grønhøj, 2020).

Implications

The study's results have implications for adolescents' development, safety, and long-term health. By demonstrating that targeted nutritional interventions can lead to positive changes in body composition, this research offers a promising strategy to support healthy growth and reduce disease risk as adolescents transition to adulthood. These findings also provide valuable insights for sports professionals, coaches, and parents working with youth, suggesting practical approaches to improve nutrition.

Limitations

There are notable limitations to this study. The absence of a control group limits the ability to draw definitive conclusions about the intervention's effectiveness. While the intervention was relatively cost-effective, with meals costing less than $3 per athlete and weekly snack food costing roughly $20 per week for the entire team, the time required to purchase, prepare, and make the food available may be more limiting. Additionally, the nutrition education provided was not a one-size-fits-all approach; recommendations were individualized based on each athlete's context, requiring educated personnel who have direct connections with the athletes. This personalized approach, along with the reliance on time and volunteer effort, may hinder the replicability of the intervention in other settings. These constraints must be considered when interpreting the results.

Recommendations for Future Research

Future research should explore ways to make healthy food options more accessible, as this appears to be a crucial component in improving adolescents' nutrition (Hargreaves et al., 2022). Investigating funding models and volunteer structures, as well as the cost-effectiveness of the intervention, may provide insights into how similar interventions can be implemented more widely. Educating coaches and parents to implement such interventions themselves could make the approach applicable to a wider range of environments, thus extending its reach. Including a control group in future studies would strengthen the evidence base for the effectiveness of such interventions. These recommendations aim to build on the current study's findings and contribute to a more comprehensive understanding of how to support adolescent development.
Conclusion

This study provides valuable insights into the potential of a nutrition intervention to improve adolescent athletes' body composition. The intervention's combination of food availability with education, individualized prescriptions, assessment of athletes' current eating habits, and consultation with the athletes on their preferences sets it apart. While there are limitations to consider, the findings contribute to our understanding of effective strategies for promoting healthy eating habits among adolescent athletes. The implications of this research extend beyond youth sports, offering a pathway to foster healthier eating habits in adolescents. This multifaceted approach to nutritional guidance represents a promising direction for future research and practice in the field of adolescent nutrition.

References


Ludbrook, J. (2013). Should we use one-sided or two-sided P values in tests of significance?. Clinical and experimental pharmacology and physiology, 40(6), 357-361.


Appendix A

Initial Nutrition Questionnaire

- What do you usually eat for breakfast?
- What do you usually eat for lunch?
- What do you usually eat before practice?
- What do you usually eat after practice?
- What do you usually eat for dinner?
- Do you usually have snacks between meals? If so, what do you typically have?
- Do you have any dietary restrictions or foods that you avoid?
- Do you eat differently on days when you have a game or competition? If so, what do you do differently?
### Appendix B

**Food/Meal Ingredients and Macronutrient Compositions**

#### Ingredients and Macronutrient Content of Gameday Meal (Provided on Two Occasions)

<table>
<thead>
<tr>
<th>Food (Meal)</th>
<th>Calories (kcal)</th>
<th>Carbohydrates (grams)</th>
<th>Fat (grams)</th>
<th>Protein (grams)</th>
<th>Fiber (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra! – Chunky Avocado Spread (57 g)</td>
<td>90</td>
<td>5</td>
<td>8</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Lundberg California – Jasmine White Rice (¾ cup cooked)</td>
<td>160</td>
<td>36</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sam’s Club – Chicken Tenders (4 oz)</td>
<td>100</td>
<td>0</td>
<td>1</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>350</strong></td>
<td><strong>41</strong></td>
<td><strong>9</strong></td>
<td><strong>28</strong></td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>

#### Ingredients and Macronutrient Content of Travel Day Meal (One Occasion) and Post Game Dinner (One Occasion)

<table>
<thead>
<tr>
<th>Food (Meal)</th>
<th>Calories (kcal)</th>
<th>Carbohydrates (grams)</th>
<th>Fat (grams)</th>
<th>Protein (grams)</th>
<th>Fiber (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sam’s Club 90/10 Ground Beef (4 oz)</td>
<td>200</td>
<td>0</td>
<td>11</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>Kerrygold Cheddar (1 oz)</td>
<td>111</td>
<td>0</td>
<td>9</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Lundberg California – Jasmine White Rice (¾ cup cooked)</td>
<td>160</td>
<td>36</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>471</strong></td>
<td><strong>36</strong></td>
<td><strong>20</strong></td>
<td><strong>33</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

#### Weekly Snack Foods Provided to Athletes and Their Macronutrient Content

<table>
<thead>
<tr>
<th>Food (Snack)</th>
<th>Calories (kcal)</th>
<th>Carbohydrates (grams)</th>
<th>Fat (grams)</th>
<th>Protein (grams)</th>
<th>Fiber (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuji Apple (1 medium)</td>
<td>80</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Banana (1 medium)</td>
<td>105</td>
<td>27</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Orange (1 medium)</td>
<td>62</td>
<td>15</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Cuties – Mandarins (1 small)</td>
<td>35</td>
<td>9</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Frigo – String Cheese (1 piece)</td>
<td>80</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Member’s Mark – Whole Milk (8 fl oz)</td>
<td>160</td>
<td>13</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Member’s Mark – Creamy Peanut Butter (1 tbsp)</td>
<td>90</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>