

Nutritional Analysis of a Female College Athlete

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Introduction

This nutritional analysis looks at the dietary habits, macronutrient, and micronutrient intake of a female college athlete. This subject is 20 years old, 65 inches tall, and weighs 142 pounds. According to Yon and Johnson (2005), the estimated activity level of a 20 year-old female who walks just under 3 miles daily is 1.5. Therefore, the estimated activity level of 1.5 was used to calculate the estimated daily caloric need of 2508 kilocalories (kCals). According to McGuire and Beerman (2013), adults need to consume 45-65% of their calories from carbohydrates, 20-35% of their calories from fats, and 10-35% of their calories from protein. This individual was recommended to consume 40% (1003.2 kCals) of their calories from carbohydrates, 30% (752.4 kCals) of their calories from fats, and 30% (752.4 kCals) of their calories from proteins (Figure 1). Additionally, recommendations for Vitamin C and Vitamin A intake were provided to the subject. According to McGuire and Beerman (2013), the recommended dietary allowances (RDAs) for Vitamin C and Vitamin A are 75 mg/day and 700 µg/day respectively.

Recommended Macronutrient Consumption
(Percentages)

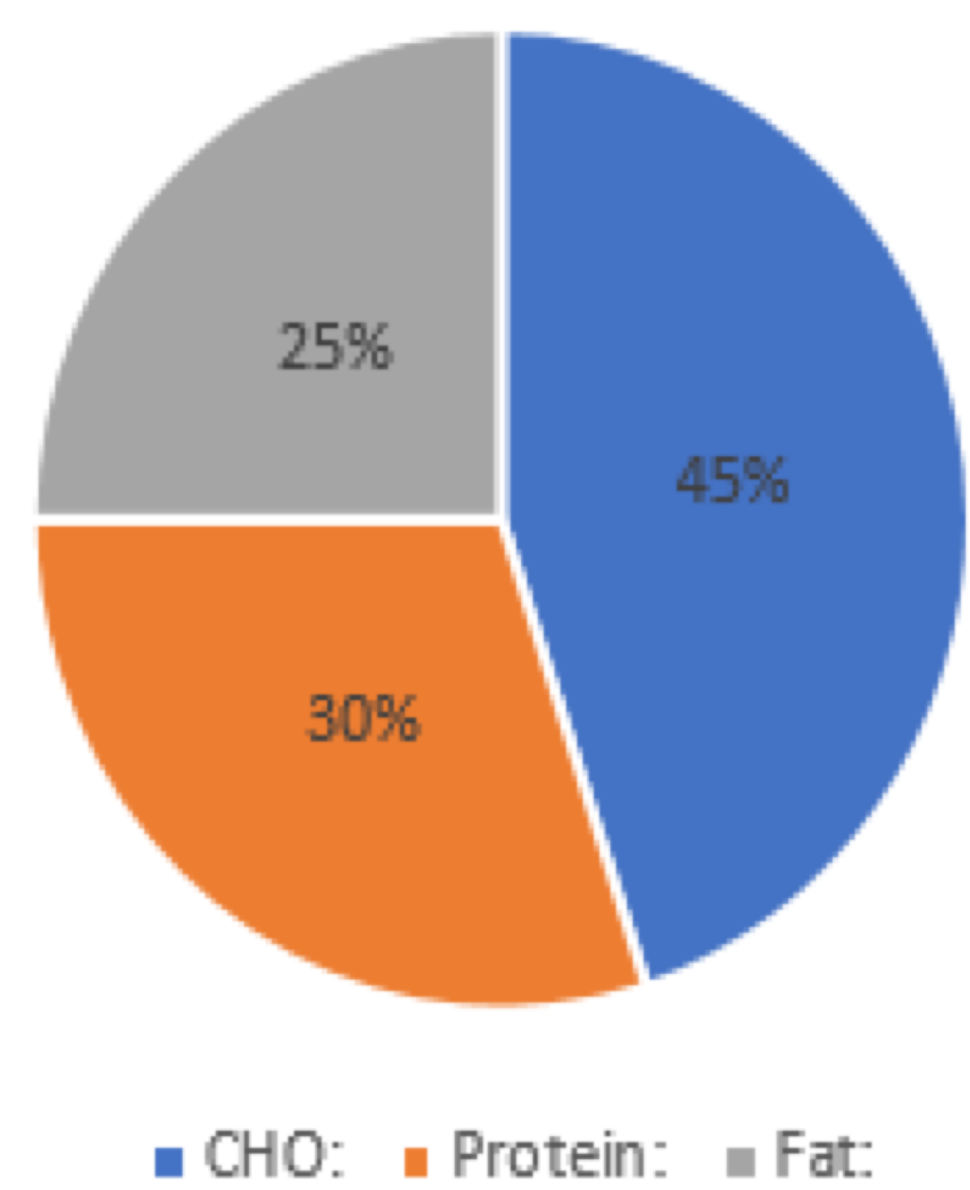


Figure 1

A water intake recommendation was given as well. According to Popkin, D'Anci, and Rosenberg (2010), a 20 year-old female should consume at least 2700mL (2.7L, 91.3oz) of water daily. Following these recommendations, the subject tracked everything that she ate for two consecutive 5 day periods. Following the first five days, nutrient and caloric intake was charted and analyzed and a recommendation was made for a second period of five days. Following the second 5 day period, nutrient and caloric intake was charted and analyzed for the completion of the study.

Table 5

Water requirements expressed in relation to energy recommendations

Sex	Age	Kcals/d	Estimated Energy Requirement	AI for fluid intake (ml/d)	Ratio AI ml/d: EER Kcal/d
Child	2-3		1000-1400	1300	0.93
	4-8		1400-1600	1700	1.06
	9-13		1600-2000	2100	1.05
	14-18		2000	2300	1.15
	19-30		2000-2200	2700	1.23
	31-50		2000	2700	1.35
Female	50+		1800	2700	1.5
	4-8		1400-1600	1700	1.06
	9-13		1800-2000	2400	1.20
	14-18		2400-2800	3300	1.18
	19-30		2600-2800	3700	1.32
	31-50		2400-2600	3700	1.42
Male	50+		2200-2400	3700	1.54

AI for total fluids derived from dietary reference intakes for water, potassium, sodium, chloride, and sulfate

Ratios for water intake based on the AI for water in liters/day calculated using EER for each range of physical activity. EER adapted from the Institute of Medicine Dietary Reference Intakes Macronutrients Report, 2002.

Table 1: Popkin, D'Anci, and Rosenberg (2010)

Week One Analysis

After the first five days of this study, caloric and nutrient consumption was recorded and analyzed. Figure 4 portrays that the subject did not consume the recommended amount of kilocalories over the first 5 days. However, the subject did consume almost the exact recommended proportions of each macronutrient (Figure 2). Furthermore, the subject actually went over the daily recommendation Vitamin C intake, but was roughly 100µg shy the daily recommendation for Vitamin A. Additionally, the subject drank an average of 38oz of water daily, which is significantly less than recommended. On the subject's worst day, the subject actually ate very nutrient dense, nutritious foods. However, she did not consume enough of them and fell over 1400 kCals short of the recommendation and was also far from the recommended macronutrient percentages. This might have been due to a busy day of classwork or homework. The subject could modify her schedule to fit snacks into her diet throughout the day to meet her caloric needs. However, the subject did have good days. On the subject's best day, she was still almost 1200 kCals short of the recommendation, but was almost exact with the recommended macronutrient consumption. This day probably was not filled with the amount of classwork or homework as the worst day, thus allowing for more food to be consumed.

Kilocalories of Macronutrients over First 5-Day Period (Percentages)

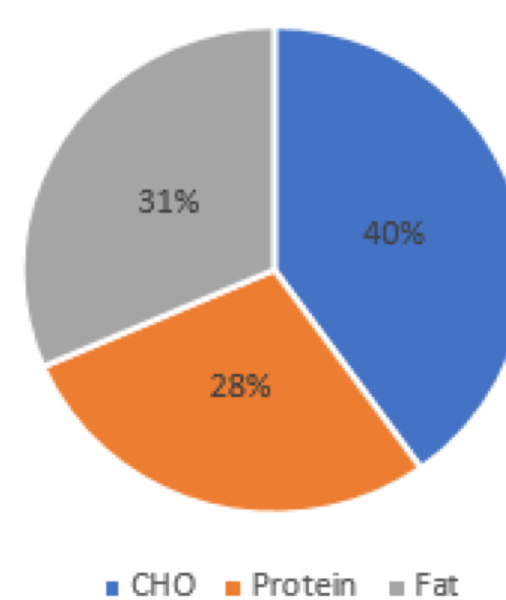


Figure 2

Recommended Macronutrient Consumption (Percentages)

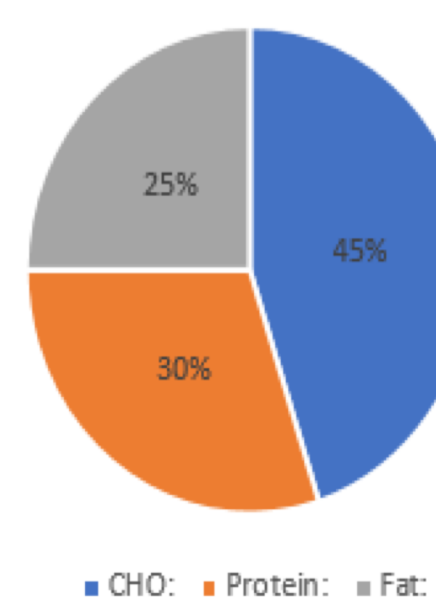


Figure 1

One food that should be removed from the diet is Chick-Fil-A Chicken Minis. While this food may be extremely tasty, it is very high in fat content and sodium. This could be replaced with a healthier breakfast food such as eggs, which still contain a good amount of fat, but are much more nutrient dense. Additionally, the amount of fruit in the diet should be increased. By simply adding a fresh fruit to every meal, the subject will increase the amount of amino acids, carbohydrates, and simple sugars she receives in a meal. Following the first five days, it was recommended that the subject increase intakes of all macronutrients and water to at least the recommended values.

Total Kilocalorie Consumption

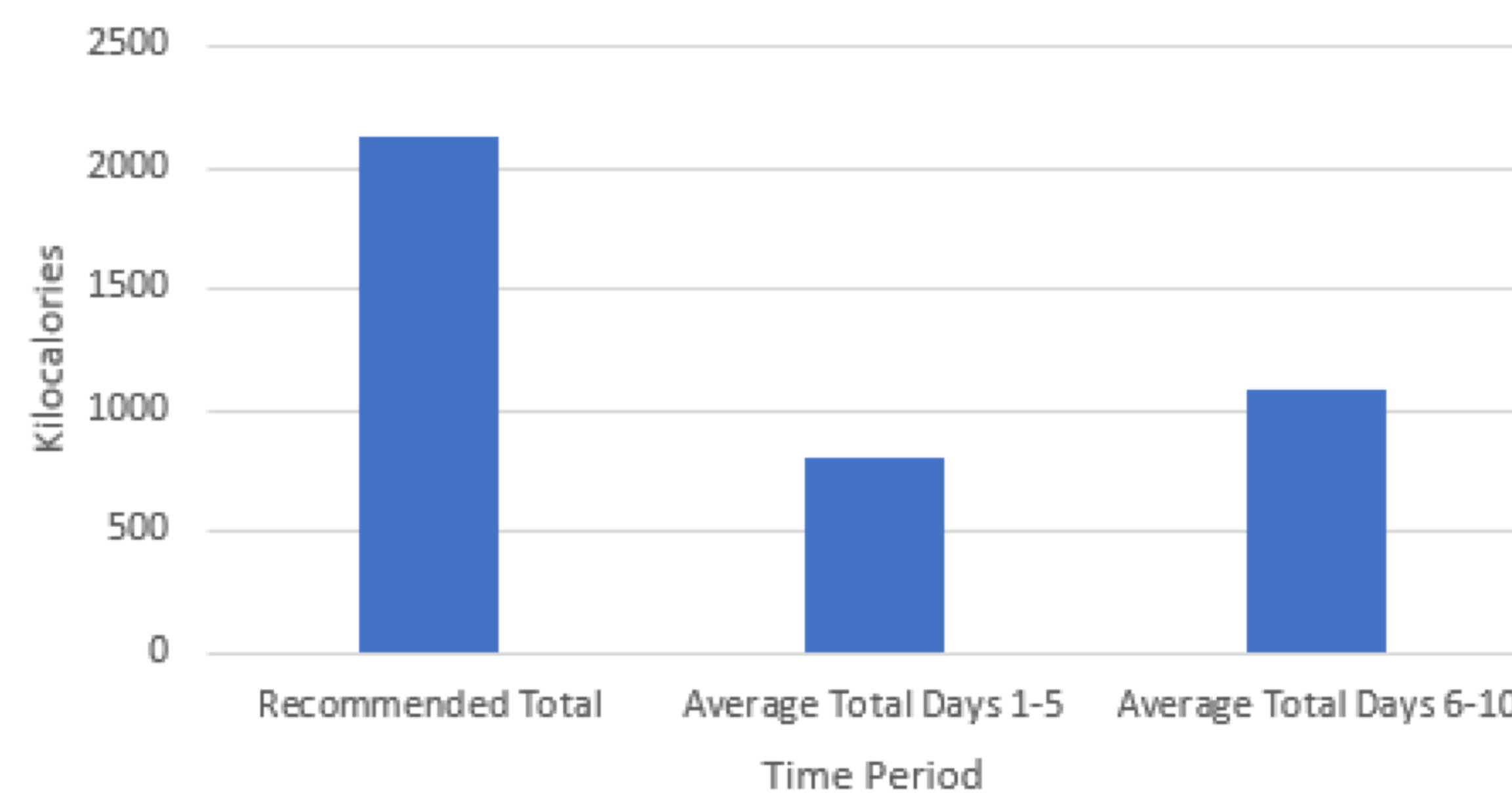


Figure 4

Week Two Analysis

Following the second five days of this study, caloric and nutrient consumption was recorded and analyzed again. Figure 4 indicates that the subject failed to reach the recommended daily caloric intake, but did eat more than in the first 5 days. However, the subject strayed from the recommended macronutrient percentages more in the second five days (Figures 3 and 1). Also, the subject failed to reach either of the daily recommendations for Vitamin C and Vitamin A, falling significantly short of the recommendations for both micronutrients. Also, the subject maintained the exact same daily water intake for the second five days (38oz), thus falling significantly short of the recommended daily intake of 91.3oz. On the subject's worst day of the second half of the study, the subject only ate breakfast and dinner and only ate a hot dog and Doritos for dinner. This might have been to a busy day, as it was over Easter break. However, this could be avoided by setting meal times beforehand or bringing snacks to eat throughout the day. On the best day of the second half of the study, the subject ate a wide variety of nutrient dense foods, including a wide array of fruits and vegetables such as spinach and bananas. This might have been due to having set meal times at which the subject must eat. This helps to keep the subject disciplined and eating three nutritious meals daily.

Kilocalories of Macronutrients over Second 5-Day Period (Percentages)

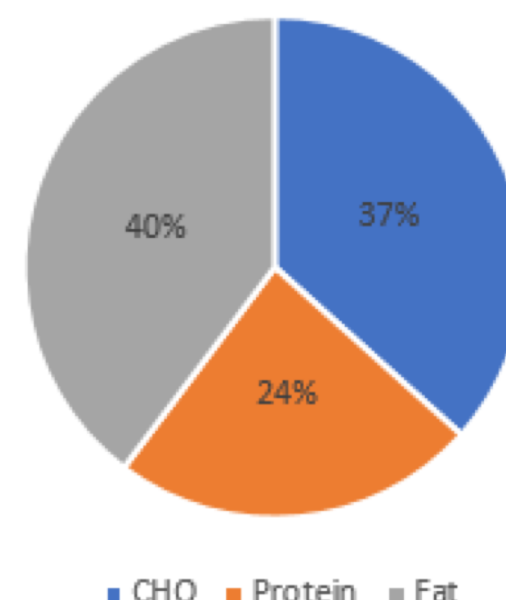


Figure 3

Recommended Macronutrient Consumption (Percentages)

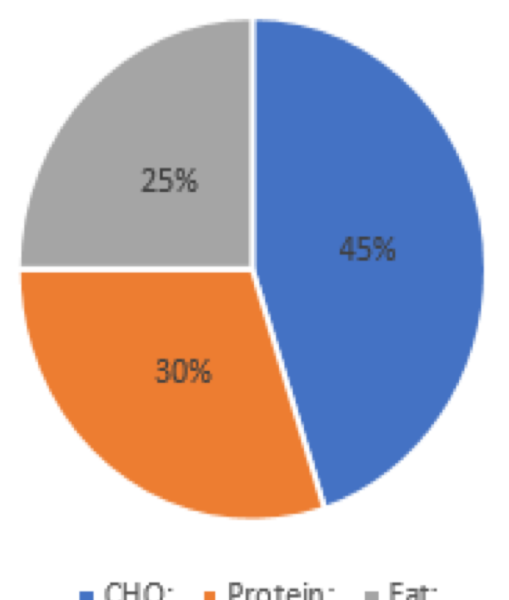


Figure 1

Conclusion

This study revealed that this female collegiate athlete eats macronutrients within the AMDR ranges and within her desired ranges. However, the subject consistently does not eat enough calories for her lifestyle. In fact, the subject's diet is inconsistent and improved very little following the recommendations made. This can be seen in Figure 4 and by looking at the comparisons made between Figures 2 and 3 and Figure 1. This subject must improve her diet and consume more kilocalories on a daily basis while maintaining a good macronutrient balance.

References

- McGuire, M., & Beerman, K. A. (2011). Nutritional sciences: From fundamentals to food. Belmont, CA: Thomson/Wadsworth.
- Popkin, B. M., D'Anci, K. E., & Rosenberg, I. H. (2010). Water, hydration, and health. Nutrition reviews, 68(8), 439-458. doi:10.1111/j.1753-4887.2010.00304.x
- Yon, B. A., & Johnson, R. K. (2005). US and Canadian Dietary Reference Intakes (DRIs) for the macronutrients, energy and physical activity. Nutrition Bulletin,30(2), 176-181. doi:10.1111/j.1467-3010.2005.00498.x