10 Day Nutritional Assessment for a Female College Athlete

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Subject Introduction

The subject for this study is a 21 year old female with a height of 67 inches and weight of 155 pounds. The basal metabolic rate (BMR) is used to estimate the amount of energy needed for a subject at rest and takes age, height, weight, body composition and gender into account (McGuire & Beerman, 2018). The estimated energy requirement (EER) is the estimated amount of energy required for a subject based on their BMR and activity level (McGuire & Beerman, 2018). The BMR for this subject is 1545 kcals and their EER is 2670 kcals. According to McGuire and Beerman (2018),, the acceptable macronutrient distribution range (AMDR) is 45-65% carbohydrates, 10-35% protein, and 20-35% fat. This equates to a range of 300-430 grams of carbohydrates, 67-233 grams of protein, and 60-104 grams of fat. According to the Institute of Medicine (2011), the recommended amount of iron is 18 mg/day and the recommended amount of calcium is 1000mg a day. Figure 3 shows that the subject was below this recommendation for both week one and week two. Figure 3 shows the improvement of calcium in week 2 to meet the DRI value.
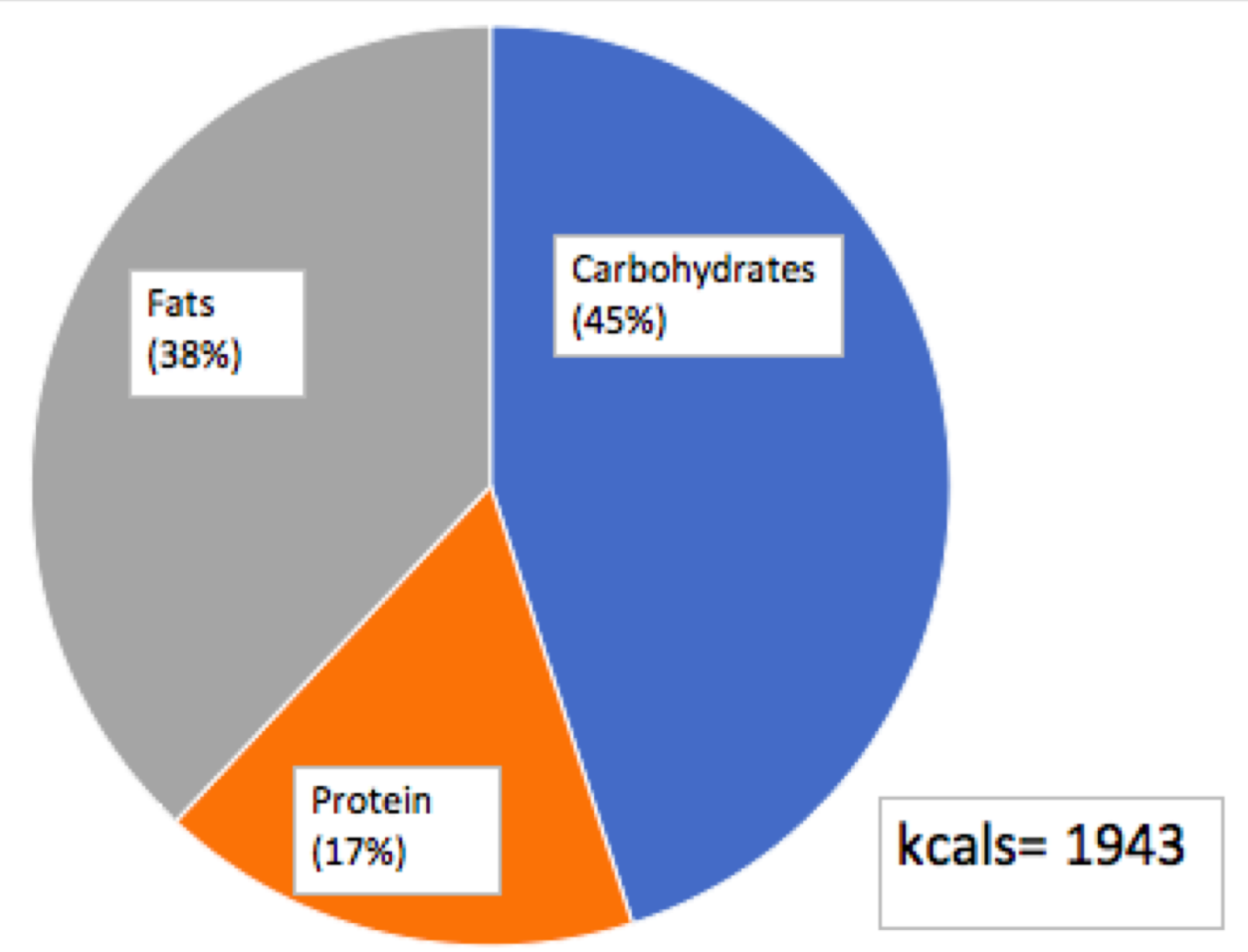
Macronutrient Data

Figure 1: Week 1 macronutrient distribution

As shown in Figure 1, the subject consumed an average of 1943 kcals/day; 45% carbs, 17% protein and 38% fat. Carbohydrates and protein are within the AMDR, but fat should be 20-35%. Subject should consume closer to 2670 kcals. According to McGuire and Beerman (2018), only 10% of daily calories should come from added sweeteners, but an average of 12% of calories came from added sweeteners for week one.
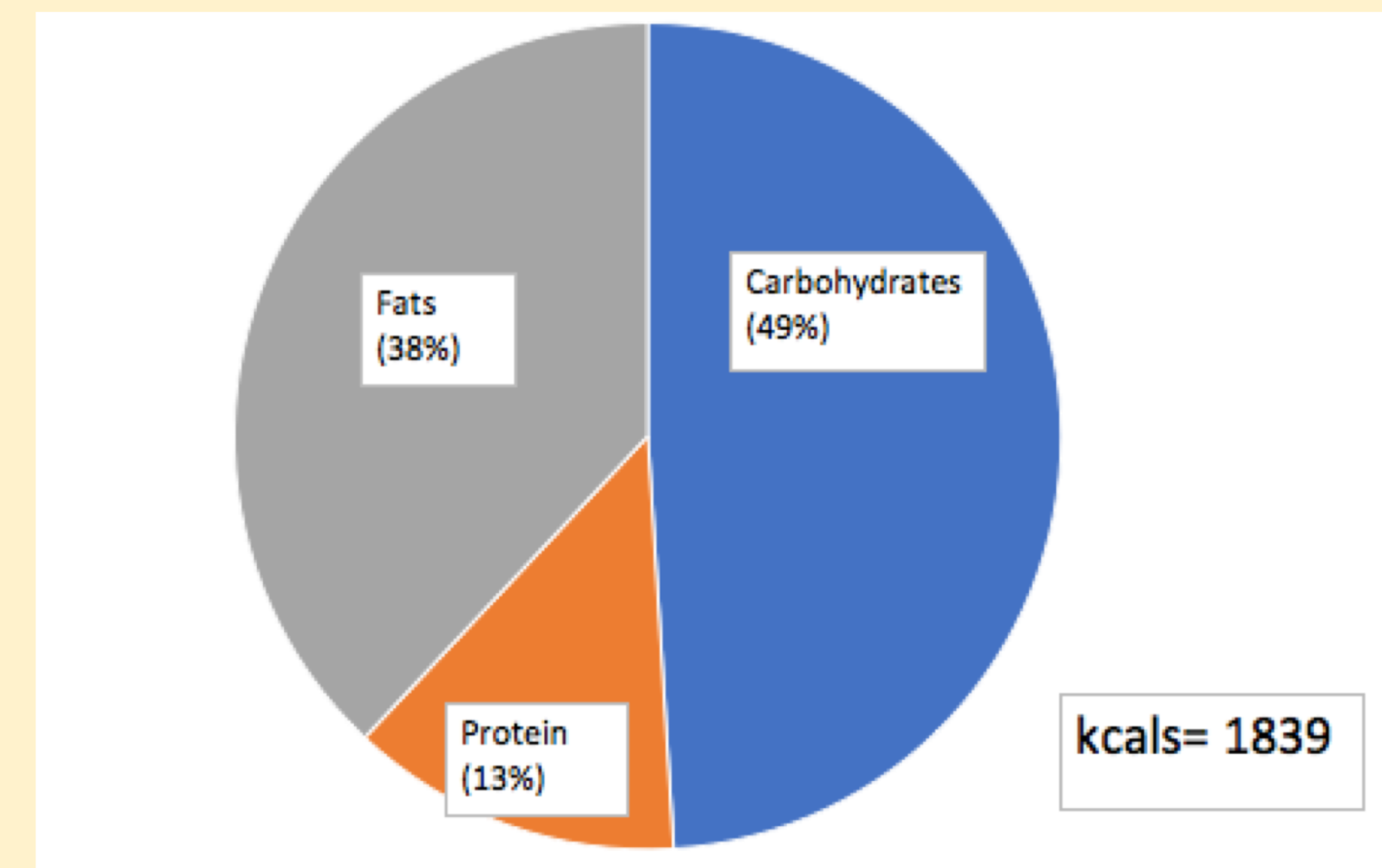

Figure 2: Week 2 macronutrient distribution

Subject consumed an average of 1839 kcals; 49% carbohydrates, 38% fats, and 13% protein. Carbohydrates and protein are within the AMDR. The percentage of fat should be between 20-35% (McGuire and Beerman, 2018). Subject should consume closer to 2670 kcals. According to McGuire and Beerman (2018), only 10% of daily calories should come from added sweeteners, but week two average 21% of calories coming from added sweeteners.

Week One Recommendations

According to McGuire & Beerman (2018), the subject consumed below the recommended grams of carbohydrates, so it is recommended that the subject adds more carbohydrates to their diet. According to McGuire and Beerman (2018), It is also recommended that the subject consumes more red meat and leafy greens in order to increase their iron consumption to reach 18 mg/day.

According to McGuire and Beerman (2018) the subject consumed a higher number of added sweeteners than recommended by the AMDR. The subject should eliminate the sugary drinks from their diet including Gatorade, lemonade, and sugary coffees to keep the added sugar below 10% of kcals consumed. In order to make this change, the subject should drink more water, so they are less tempted to consume the sugary drinks when they are thirsty.

According to Convertino et al (1996), females with similar age, height and weights should consume 2.8 L of water a day and the subject from this study consumed an average of 1.4 L/day. In order to meet this goal, the subject could find a water bottle that they like and keep it by them constantly filled so they are encouraged to drink.

Week One Results

Macronutrient Averages	Macronutrient Recommendations
Protein: 77g/day, 308 kcals/day, 17% AMDR	Protein in grams and AMDR ratio is adequate
Fats: 84g/day, 756 kcals/day, 38% AMDR	Fats in grams is adequate, but should be lower in AMDR ratio
Carbohydrates: 219g/day, 876 kcals/day, 41% AMDR	Carbs is low, should be between 300-433g/day and 45-65% AMDR
Water: 1.4 L/day	Water intake is too low, should be 2.8 L/day

Week Two Results

| Macronutrient Averages	Macronutrient Recommendations
Protein: 54g/day, 216 kcals/day, 13% AMDR	Protein is too low, should be between 67-233g/day
Fats: 83g/day, 747 kcals/day, 38% AMDR	Fats in grams is adequate, but should be lower in AMDR ratio
Carbohydrates: 218g/day, 872 kcals/day, 49% AMDR	Carbs is in gramslow, should be between 300-433g/day
Water: 0.56 L/day	Water intake is too low, should be 2.8 L/day

Micronutrient Data
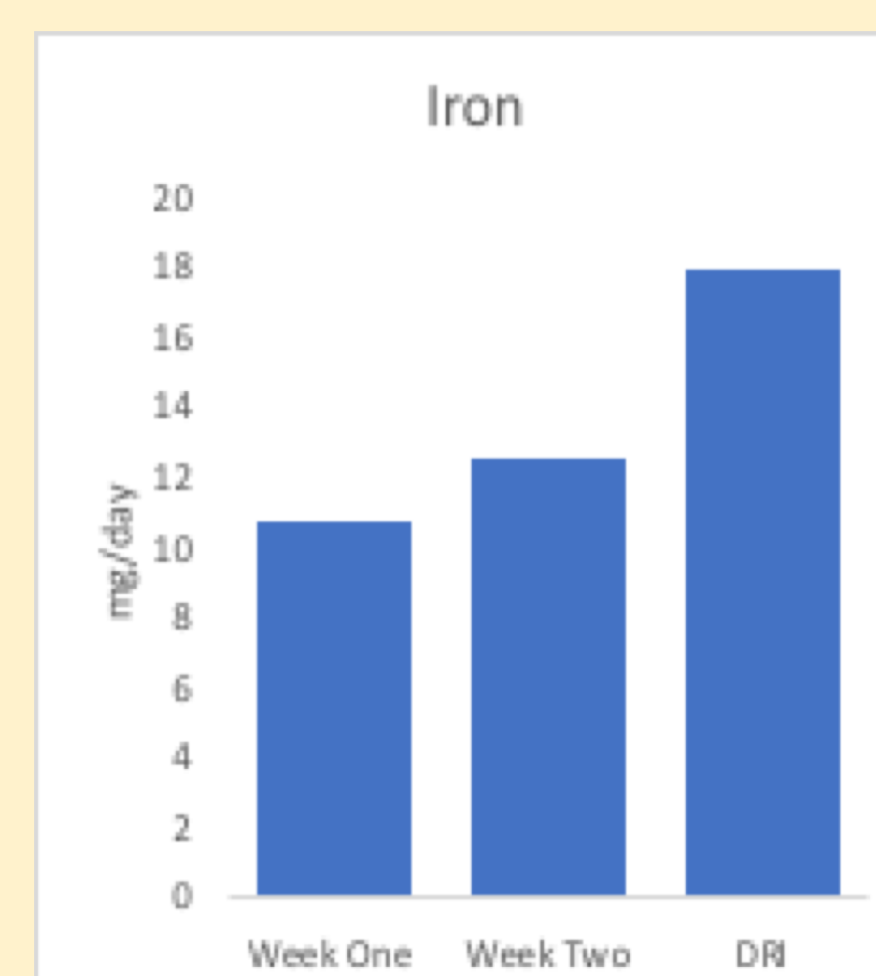
Figure 3: Comparison of iron consumption in week 1 and 2 to the DRI
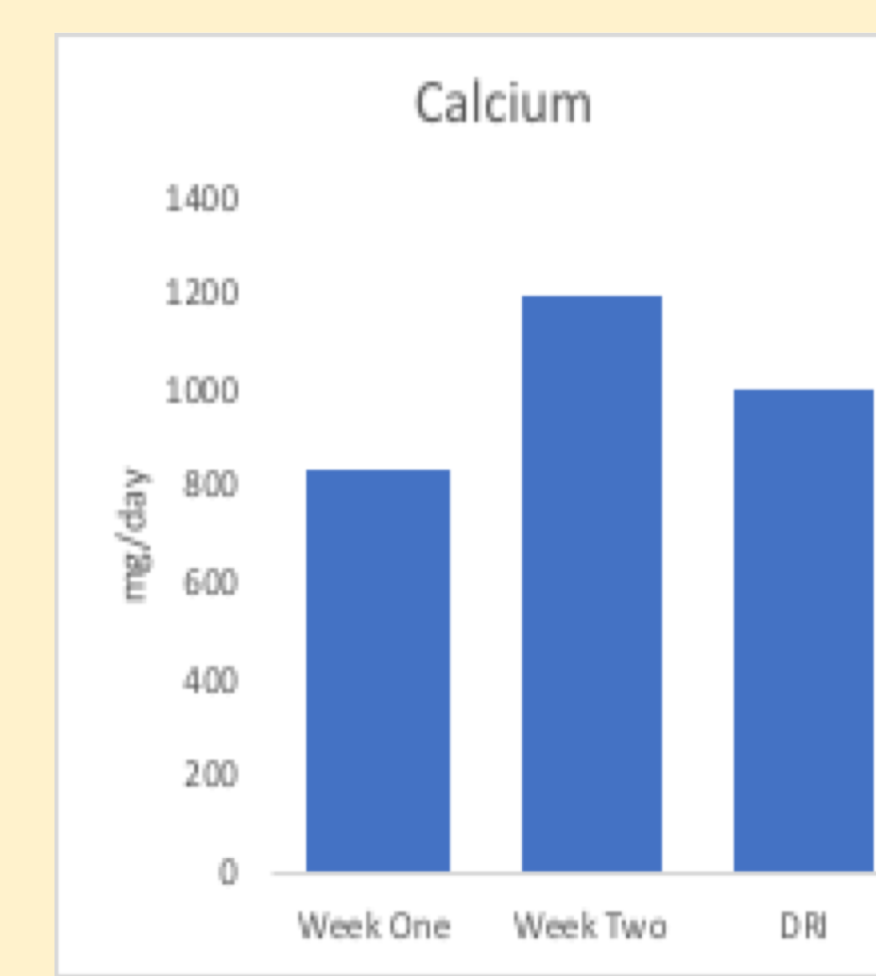

Figure 4: Comparison of calcium consumption in week 1 and 2 to the DRI

Week One Good & Bad Day

According to the recommendations made in McGuire and Beerman (2018), the day furthest from the AMDR was day 2. On day 2, the subject consumed 135 grams of carbohydrates (38% AMDR) and 53 grams of fats, (37% AMDR). The subject consumed a total of 1302 kcals, which is half of the recommended kcals. This variation from the recommendations is due to the fact that the subject was traveling on that day and had limited resources to balanced foods. To avoid such a day from occurring again, the subject could plan in advance and pack foods, or be more aware and selective of the given food choices.

According to the recommendations made in McGuire and Beerman (2018), the day closest to the AMDR was day 3. The subject consumed a total of 2323 kcals with 53% from carbohydrates, 35% fats, and 13% protein. This day was closest to the recommended values because the meals were consistent with what was usually eaten, and less thought was put toward planning or preparing what to eat. To have more days close to the recommended values, the subject could keep a similar schedule, or prepare meals for convenience during busier days.

Week Two Good & Bad Day

On day 4, the subject consumed a total of 1050 kcals; 71% carbohydrates, 16% fats and 13% protein. According to McGuire and Beerman (2018), the percentage of carbohydrates should be between 45-65%, and the percentage of fats should be between 20-35%. Since the subject only consumed 1050 kcals, none of the macronutrients reached the recommended amount in grams. The values from this day were different from the recommendations because the subject felt they had over-consumed during the previous days from Thanksgiving and the leftovers. To prevent days like this from occurring, the subject should continue with normal eating habits following holidays to restore their previous eating schedule.

On day 3, 2675 calories were consumed with 321 grams of carbohydrates, 125 grams of fat, and 67 grams of protein. This day is the closest to the recommended amount of each nutrient, but fat is higher than recommended by McGuire and Beerman (2018). Fat consumption should be between 60-104g/day. On this day the subject ate intuitively and paid less attention to "right" or "wrong" foods which suggests they should follow this eating strategy on most days.

Conclusion

By looking at figure 1 and 2, it is seen that the subject consumed an average of 1943 kcals for week 1 and 1839 kcals for week 2 and the EER is 2670. Figure 1 shows that the subject consumed too few carbohydrates per the AMDR, and too high of fat per the AMDR for week 1. In week 2, figure 2 shows the subject improved their carbohydrate AMDR, but fat stayed at 38% AMDR. Per the recommendations made following week 1, the subject did make some improvements. Figure 3 shows the average daily intake of iron increased from 10.7 mg to 12.5 mg and figure 4 shows the intake of calcium increased from 834 mg to 1198 mg. On the other hand, the amount of added sugars increased from 12% to 21%, which is further away than the recommended value of 10% (McGuire and Beerman, 2018). The amount of carbohydrates decreased from an average of 219 grams to 218 grams and the recommended is between 300-433g/day.. The subject also consumed an average of only 0.56 liters of water compared to the 1.4 liters from the previous week and the 2.8 liters recommended by Convertino et al (1996). Overall, the subject did not make the recommended improvements, which is likely because it was Thanksgiving week and the subject was on a different schedule than usual.

References

Convertino V, Armstrong L, Coyle E, Mack G, Sawka M, Senay L, Sherman W, (1996). American College of Sports Medicine position stand. *Exercise and fluid replacement*. Med Sci. Sports Exerc 1996;28:i-vii.

Institute of Medicine (US) Committee to Review Dietary Reference Intakes for Vitamin D and Calcium; Ross AC, Taylor CL, YaktineAL, et al., editors. Dietary Reference Intakes for Calcium and Vitamin D. Washington (DC): National Academies Press (US); 2011 doi:10.17226/13050

McGuire, M., Beerman, K. (2018). *Nutritional sciences: from fundamentals to food.* (3rded.). Cengage Learning.