Ten Day Nutritional Assessment

By: Kaylin Schuda, Weslyn Almond & Kinzy Hancock

This project is for educational purposes only.

GARDNER-WEBB UNIVERSITY

Introduction

Estimated energy requirement (EER) is the daily caloric amount needed to maintain the amount of energy required (Williams, 2010). Basal metabolic rate (BMR) is defined as the caloric need for the body during rest (Williams, 2010). According to Robertson et al. (2017) the accepted macronutrient distribution ranges (AMDR) is 45%-65% carbohydrates, 10%-35% proteins and 20%-30% lipids. The subject was a 20 year old female who weighed approximately 170 pounds. Their estimated activity level is high. Their height is 64 inches. The subject's basal metabolic rate (BMR) is 1601.3 kcal per day. Due to their activity level, the subject's estimated energy expenditure is 2762.24 kcal per day.

Table 1.

AMDR and DRI for macronutrients and micronutrients

Recommended	Carbohydrate (kcal)	Lipids (kcal)	Protein (kcal)	Water (oz)	Vitamin A (µg)	Iron (mg)
Amount	1243 - 1795	552 - 966	276 - 966	91	700	18

Week One

According to Douglas, Lawrence, Bush, Oster, Gower and Darnell (2007), the Harris Benedict equation is [655 + (4.35 x weight in pounds) + (4.7 x height in inches) - (4.7 x age in years)]*the activity level of the subject. Due to the subject being an athlete, their activity level was in the very active range. The multiple value was 1.75. The subject was very low on their caloric consumption when comparing it to the Harris Benedict recommendation. As seen in Figure 1, the subject has good caloric distribution ratios.

On the subject's best day, they had the most calories consumed.

This means they were closest to the AMDR and DRI.

The subject consumed 2351 total kcals, 160 ounces of water, 3,248 µg of Vitamin A and 12.06 mg of Iron. On the subject's worst day, the subject only consumed 1746 kcals, 71 ounces of water, 301 µg of Vitamin A and 10 mg of Iron. The subject consumed high sugar foods on their worse days due to stress, an example of this is when they consumed a lollipop and pizza on the same day.
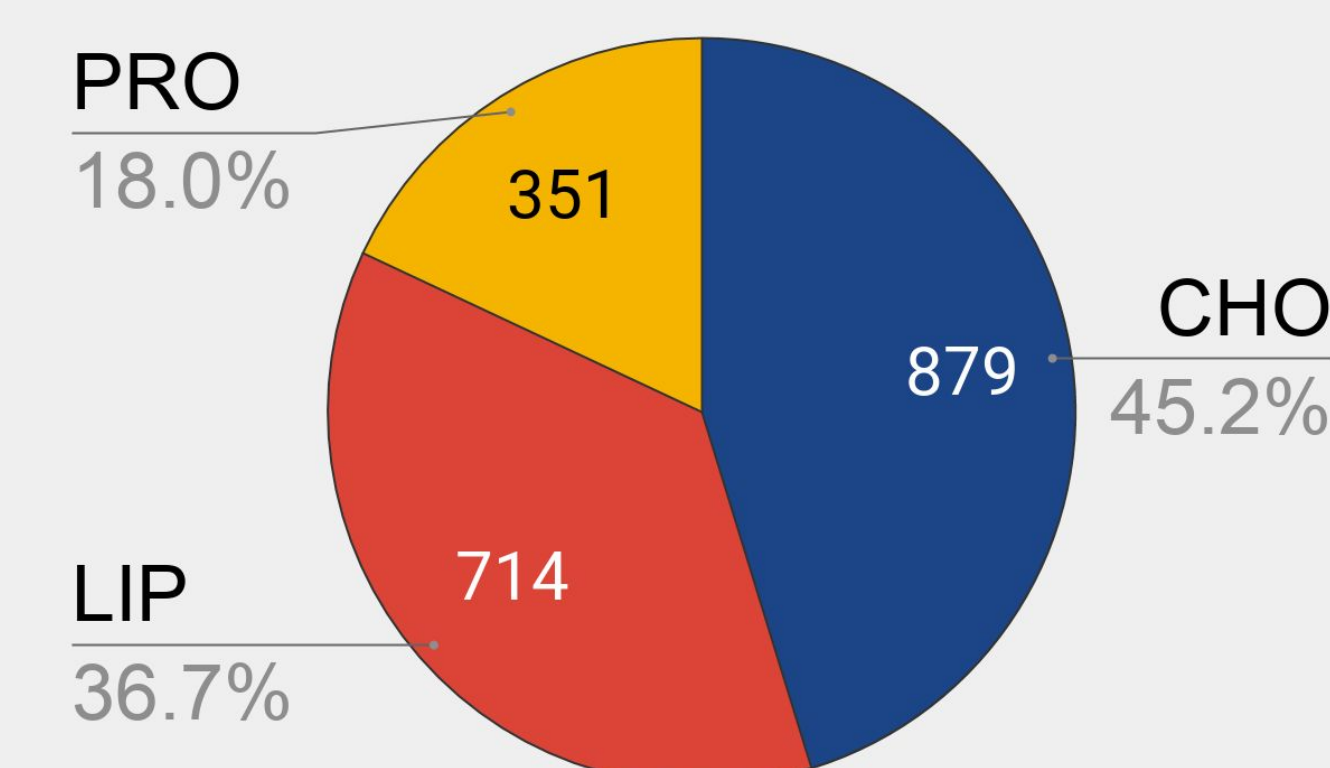
PRO 18.0% — 351
CHO 45.2% — 879
LIP 36.7% — 714

Figure 1. *The subject's caloric distribution for week one.*

Recommendations

The subject should increase her protein and iron intakes. According to Melina, Craig, and Levin, the shift into the vegetarian diet can "supply enough of all essential nutrients when caloric requirements are met" (2016). To increase protein intake, the consumption of popular protein loaded food sources, legumes and soy products (Rizzo & Baroni, 2018), were recommended. Consuming a variety of plant foods was recommended in order to ensure consumption of all essential amino acids (Melina, Craig & Levin, 2016). It is commonly found that iron storage levels are lower in those who participate in a vegetarian diet due to the decrease of heme iron bioavailability in the diet. According to Hunt, heme iron is found in various meats and easily absorbed compared to non-heme iron (2003). Despite the large decrease of heme iron in the new diet, studies show that iron status will not be altered within a few months (Hunt, 2003). The subject has noted that the vegetarian diet paired with poultry was accepted; therefore, to increase iron intake levels, increasing poultry in the weekly diet was recommended. According to Tang, Qin, Dolnikowski, Russell and Grusak (2006), carrots and spinach provide adequate sources of Vitamin A. The consumption of carrots and spinach were recommended to the subject to consume in order for the subject to meet their Vitamin A DRI.

Week Two

The subject consumed far less lipids and more carbohydrates according to the ratio. The subject consumed on average 87.03 ounces of water out of the 90 ounces needed. The subject consumed soybeans as a protein supplement and it increased their protein range. It made their protein consumption more acceptable according to the AMDR. The subject consumed on average 929 µg of Vitamin A for the week. The subject also consumed approximately 11.32 mg of Iron.

On the days that the subject did not do well, they consumed approximately 22% added sugar,

On the subject's good days they consumed around 15% added sugar. The subject consumed far more vegetables on their good day. They said they felt like being healthy on the good days. On the bad days they were stressed so they consumed more sweets.
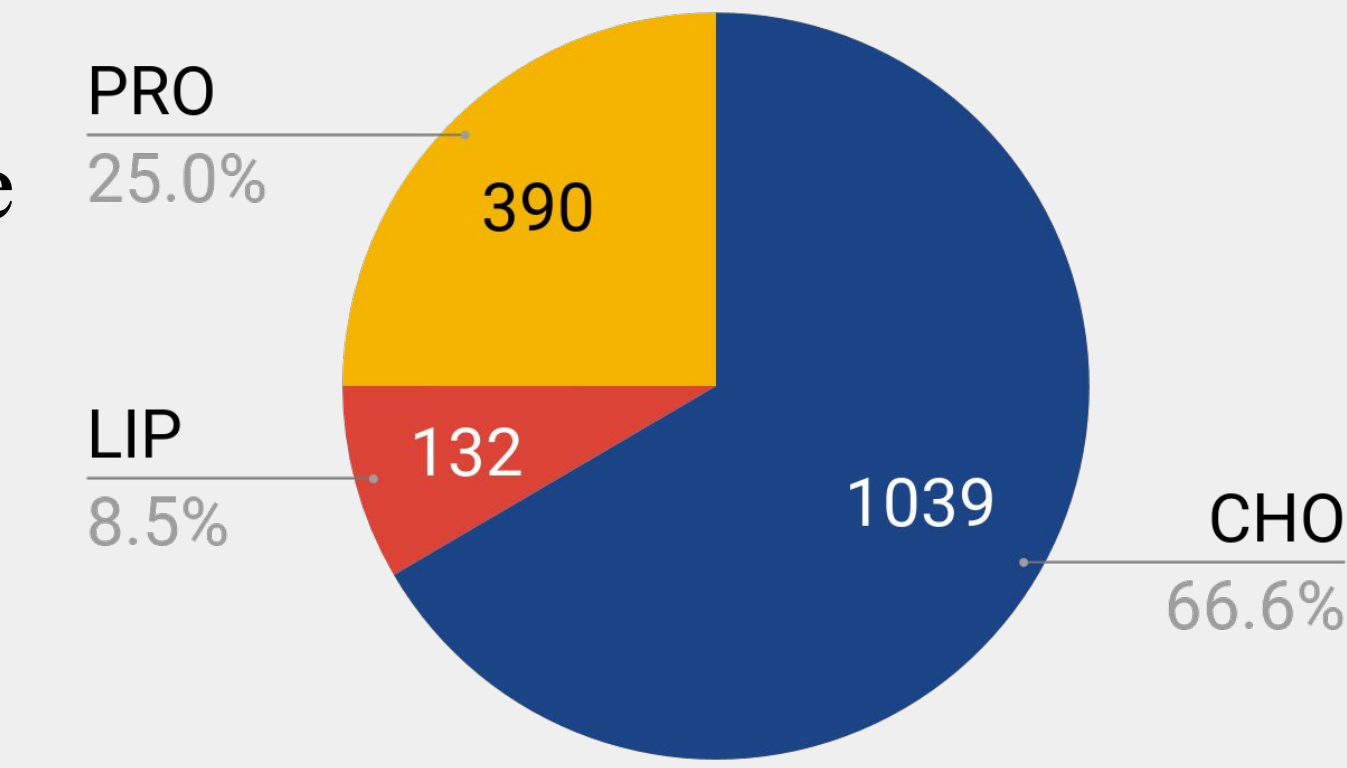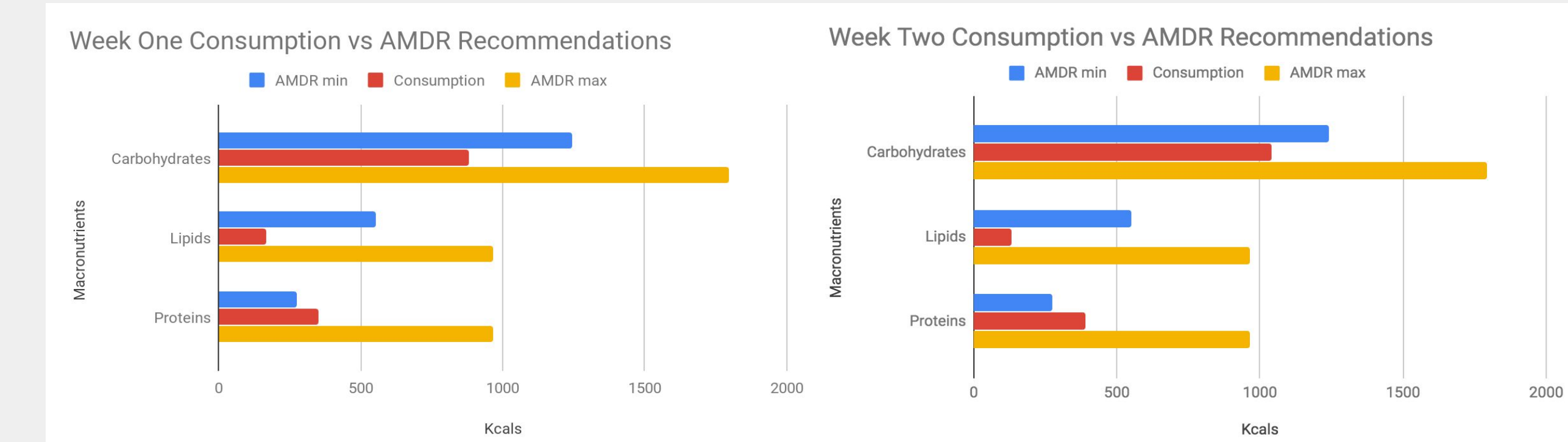
PRO 25.0% — 390
CHO 66.6% — 1039
LIP 8.5% — 132

Figure 2. The subject's caloric distribution for week two.

Evaluation

Week One Consumption vs AMDR Recommendations

Week Two Consumption vs AMDR Recommendations

The subject consumed considerably less than the AMDR standard recommendations during the two-week assessment. The subject's consumption percentage of each macronutrient was within suggested ranges, but she did not consume enough total calories overall and within each macronutrient category.

Although the subject didn't meet all of the goals and recommendations, they were a lot closer to the AMDR and DRI than their initial consumptions.

Conclusion

In hindsight, the subject should avoid stressful situations to decrease the carbohydrate consumption. If the subject found themself stressed, the subject has developed a way to cope with the stress that doesn't involve eating. The subject also plans to go to the cafeteria more often in order to get the right macronutrients. The subject has also developed a goal of consuming 4 24 ounce bottles of water a day.

In terms of overall caloric intake, the subject consumed less calories than their EER. The first week on the day of highest consumption she consumed 1000 less calories than her EER. Since protein consumption during the first week was low, they consumed a protein supplement during the second week which made her protein consumption increase and better meet the AMDR. It will be beneficial for the subject to increase her protein and iron intakes by consuming plant foods, legumes, and soy products. Overall, the subject is consuming the right types of foods, but needs to increase amount of consumption to meet caloric need.

References

Douglas, C. C., Lawrence, J. C., Bush, N. C., Oster, R. A., Gower, B. A., & Darnell, B. E. (2007). Ability of the Harris-Benedict formula to predict energy requirements differs with weight history and ethnicity. *Nutrition Research, 27*(4), 194-199. doi:10.1016/j.nutres.2007.01.016

Hunt, J. (2003). Bioavailability of Iron, Zinc, and Other Trace Minerals from Vegetarian diets [Abstract]. *The American Journal of Clinical Nutrition,78*(3), 633-639. Retrieved from https://doi.org/10.1093/ajcn/78.3.633S.

Melina, V., MS, RD, Craig, W., PhD, MPH, RD, & Levin, S., MS, RD, CSSD. (2016). Position of the Academy of Nutrition and Dietetics: Vegetarian Diets [Abstract]. *Journal of the Academy of Nutrition and Dietetics,116*(12), 1970-1980. Retrieved from https://doi.org/10.1016/j.jand.2016.09.025

Rizzo, G., & Baroni, L. (2018). Soy, Soy Foods and Their Role in Vegetarian Diets. *Nutrients, 10*(1), 43. doi:10.3390/nu10010043

Robertson, A. H., Larivière, C., Leduc, C. R., McGillis, Z., Eger, T., Godwin, A., . . . Dorman, S. C. (2017). Novel tools in determining the physiological demands and nutritional practices of ontario Fire Rangers during field deployments. *PLoS One, 12*(1) doi:http://dx.doi.org/10.1371/journal.pone.0169390

Tang, G., Qin, J., Dolnikowski, G. G., Russell, R. M., & Grusak, M. A. (2005). Spinach or carrots can supply significant amounts of vitamin A as assessed by feeding with intrinsically deuterated vegetables. *The American Journal of Clinical Nutrition, 82*(4), 821-828. doi:10.1093/ajcn/82.4.821

Williams, M. H. (2010). *Nutrition for health, fitness, & sport.* Boston, MA: McGraw-Hill.