The purpose of this teaching module is to create and demonstrate an educational module based upon teaching philosophy and theory based interventions. The target population described in this work is vegan and vegetarian endurance athletes, or those wishing to incorporate a plant-based diet. This module takes place as the second clinic with a three part series. The first series is dedicated to educating the athlete on how to consume a balance vegan or vegetarian diet. The goal of the first module is to produce behavior modification such that the athlete improves their daily consumption of food. Once, this foundation is established, the second module is applied which is specific to the nutrient needs of endurance athletes. The goal of module two is to have the athlete demonstrate an understanding pertaining to the timing of food consumption before, during, and after training/racing while improving the consumption of both micro- and macronutrients. Module three is specific to the periodization of nutrition, that is, how it energy (nutrient) needs vary during the various phases of training (base, build, race, and transition).
Introduction - Lesson Overview

Fueling as a Vegan and Vegetarian Endurance athlete is a three part mini-seminar aimed at educating and motivating the plant-based endurance athlete, or individuals interested in incorporating a plant-based diet into their lifestyles, to successfully meet their daily nutrition needs while sustaining their body for performance and recovery. Using My Vegan Plate (Vegetarian Resource Group, N.D.), the first clinic outlines the fundamentals in adequately consuming a plant-based diet to meet daily nutrition needs. The second series, focused in this teaching module, addresses the energy used by the body during endurance performance, the increase in consumption of daily nutrients and the nutrient intake timing before, during and after training and racing. The final series covers how nutrition needs vary within the annual training cycle to match the changing physiological demands of training and racing.

Individuals from all walks of life can benefit from consuming a plant-based diet. Studies show that the benefits associated with the consumption of a plant-based diet include lowering the risk for chronic diseases and associated deaths, such as lowering high blood cholesterol (LDL), type-2 diabetes, high blood pressure, heart disease, and certain types of cancer (Academy of Nutrition and Dietetics, 2013). Disease prevention is one of the many reasons people chose to consume a vegan or vegetarian diet. For endurance athletes, the choice to consume a vegan or vegetarian (plant-based) diet sometimes comes down to performance - offering endurance athletes the ability to sustain their competitive edge and recover more quickly. Yet, despite the health benefits associated with consuming a plant-based diet and the claims made by plant-based athletes pertaining to improved performance, evidence supports neither an advantage nor disadvantage if performance (Barr & Rideout, 2004). Studies do, show however, that the focus
for the vegan or vegetarian diet centers upon making sure the athlete meets adequate daily nutrition needs (Ferreri & Furman, 2006).

Rather than immediately teaching the endurance athlete how many grams of carbohydrates, proteins, and fats are required during training and racing and how the amounts change through a periodized annual training year (Seebohar, 2011), the first approach in nutrition education for the plant-based endurance athlete pertains to utilizing theory-based constructions in educational settings (Bauer, Liou, & Sokolik, 2012) to elicit behavior changes - teaching vegan and vegetarian endurance athletes the fundamentals of meeting adequate daily nutrition. From this foundation, the plant-based endurance athletes build upon behaviors learned and practiced to then increase the consumption of macronutrients (carbohydrates, proteins, and fats) to support their training and racing lifestyle. The groundwork is then laid down to modify the energy intake according to how the training season changes the nutrient needs of the individual.

The teaching philosophy utilized in this 10-minute teaching module utilizes a facilitator approach in a group setting. For effectiveness, the educator maintains an assertive behavior, that is he or she is appropriate in the environment to acting emotionally honest, direct, self-enhancing, and directive (Bauer, et al., 2012). The educator is confident and capable, while being self-respecting of others (offering approval to respect the differences in opinion or viewpoint) and is generally respected. The educator is not only a facilitator, but is also a model of someone who practices what speak. The goal is to ask questions of the groups that arouses learning and responsibility to increase self-efficacy in the confidence to consume a healthy balance of food and energy for endurance performance. The teaching philosophy also addresses the various ways in which adults learn, that is, defers to various teaching methods, such as use of videos, visual aids, rewards systems (positive reinforcement) making learning fun and engaging. Pertaining to
engagement of the participants, active learning is supported by the use of a pre assessment to
determine the needs and education level of the group.

The learning principals demonstrated in the Fueling as a Vegan and Vegetarian
Endurance athlete is the social cognitive theory and health belief model. Within social cognitive
theory in a group education setting, the facilitator utilizes power point presentations, visual aids,
and demonstrates food and nutrition knowledge and skills to elicit behavioral changes (Bauer et
al, 2012). Participants are rewarded as a way of acknowledging and recognizing participation
and comprehension of the education. Within the power point, the educator provides examples
(models) of endurance athletes that successfully through the consumption of plant-based
nutrition. The educator utilizes an impactful 30-second video at the beginning of the 10-minute
teaching module not only as an attention grabber, but moreover to address the nature and impact
of endurance training as it pertains to the need for an increase consumption of energy and the
importance of nutrient timing and amounts before, during and after an event to build within the
health belief model. The result of the video conveys the physiological demands place upon the
body during training and racing an endurance event. During the teaching module, the educator
addresses the consequences of failing to ingest adequate amounts of carbohydrates (or other
macronutrients specific to daily and training nutrition), demonstrated as a “bonk” or muscle
wasting, as the perceived severity. The message to the participants is that endurance athletes eat
for a purpose – they eat to train, which can be considered a benefit (eating) as well as success in
their ability to adapt to specific training loads and during the event. The goal is to increase self-
efficacy, i.e., the confidence a participant holds in their ability to choose nutrient dense foods
that support the special nutrient needs of the vegan or vegetarian endurance athlete. A secondary
goal is to have the endurance athlete recognize the purpose of increasing nutrient consumption - fueling for a purpose, eat to train, not train to eat.
Lesson Plan Using Constructs from Social Cognitive Theory

Fueling as a Vegan and Vegetarian Athlete, Part 2

Duration: 8-10 minutes

Teaching Module Name: Fueling the Vegan and Vegetarian Endurance Athlete, Part 2

Target Group: Endurance athletes (newer and experienced) interested in improving their foundation of their daily diet and training and race day nutrient needs by way of consuming a plant-based diet.

Overall Goal:
To increase participant knowledge and self-efficacy in consuming nutrient dense foods that support increased energy needs of the endurance athlete, but more specifically, of carbohydrate consumption and nutrient timing before, during, and after training and racing.

Major Concepts:
- Proportion of energy utilized by body during various training intensities
  - Carbohydrates
    - Glucose
    - Glycogen
  - Fat
  - Protein
- Daily nutrition recommendations
- Training nutrition recommendations
  - Pre training/race
  - During training/race
  - Post training/race

Icebreaker or Attention Grabber: (3:30 seconds)
- Ironman Coeur d’Alene video (30 seconds), demonstrating the importance and need for an increase in nutrition consumption due to the demands and rigor of endurance sports.
- Show “My Vegan Plate” as a recap of mini-clinic series session one.
- Ask audience to define the word endurance.
- Have athletes taste the Vega Sport Endurance bar (plant-based, gluten, soy, wheat, and dairy free) to demonstrate the ease at which it breaks down in the mouth upon chewing.
- Sample of Vega Sport Endurance Electrolyte Hydrator in front of each audience member.
- Pop-quiz give-aways of a Vega shaker bottle with product.
Objectives and Learning Domains; Generalizations and Learning Experiences

1. The audience will state the primary macronutrient used by the body during endurance training and understand its use during exercise intensity.

**Domain:** Cognitive – knowledge

**Generalization:**

Carbohydrates are the primary fuel burned during exercise and is limited in supply in the body (stored as glycogen and glucose).

**Learning Experience:** (1:30 – 2:00)

Provide a colored graph in power point demonstrating the percentage at which carbohydrates, fats, and proteins are used during various exercise intensities. As a result, the educator leads to the statement that carbohydrate is the primary energy source used during exercise. End of session give-away includes a prize for knowing this answer. Post seminar evaluation is sent asking which energy source is primarily used during exercise.

**Use of Carbohydrates During Exercise**

- At rest the body utilized approximately equal proportions of carbohydrates, proteins, and fats.
- During low intensity exercise (aerobic, with oxygen) the body burns more fat the carbohydrate, but still burns carbohydrate. Protein is spared.
- During intense exercise, the body utilizes greater carbohydrates stores and fatty acid oxidation decreases; protein is spared until glycogen stores are depleted.

2. Participants will be able to calculate daily nutrition needs while journaling the application of this knowledge for 3-5 days. The participant will be able to share their learning and observations in the subsequent mini-series session.

**Domain:** Cognitive - application

**Generalization:** Daily carbohydrate (CHO) recommendations for the endurance athlete are 6-10 grams per kilogram of body weight a day. Consume 1.2 g carbohydrate per kilogram body weight within 30 minutes following exercise.

**Learning Experiences:** (2:00 – 4:00)
Discuss daily nutrient recommendations during exercise and specific needs before, during, and after endurance training. Review handout and how to personally calculate nutrient intakes.

**Daily Nutrition Needs**

- Divide body weight in pound to kilograms by dividing by 2.2 kilograms.
- CHO: 6 – 10 g/kg BW
- PRO: 1.2 – 1.4 g/kg BW
- FAT: 0.8 – 1 g/kg BW

**Nutrient Timing Before, During, and After Training/Racing**

- Before: top off glycogen stores 10-20 min prior to event by consuming 10-20 g CHO.
- During:
  - Consume 30-60 g CHO every hour.
  - Sip 7-10 oz fluid every 15 – 20 minutes.
- After:
  - Rehydrate with 20-34 oz fluid for every pound of weight lost.
  - First 30 min. and 2 hr. after consume 1.2 g CHO/kg BW + 6-20 g PRO if training > 90 minutes.

**Teaching Aids and Materials**

(Set up 45 minutes prior to participant arrival)

✓ Technical/Media
  - Computer
  - Power Point Presentation (backed up on USB and as slide handout)
  - Projector
  - White display screen or wall
  - Adaptor for Mac/Apple
  - Clicker/remote (to forward Power Point screen)

✓ Participant handouts
  - Education handout (8 ½ x 11)
  - Vega Sport brochure (place education handout in page 16)
  - 1 napkin each (total = 52)
  - Vega Sport Endurance Bar (20 bars cut into 1/3 pieces)
    - Place bar on napkin in
Summary:

Endurance sports are no longer reserved as a sport for well trained, conditioned elite triathletes. With an increase in participation in age range and ability, the component of nutrition education, pertaining to endurance sports, plays a key role in addressing the needs of an endurance lifestyle. Due to the physiological demands placed on the body during training, nutrition needs are higher. An increase in macronutrients (carbohydrates, proteins and fats) contributes to restoring energy (muscle and liver glycogen), facilitates energy output and sustainability (endurance) and slows down the breakdown of protein during prolonged exercise.

Evaluation: (1 min. 30 sec.)

One week prior to the presentation, a pre assessment (Monkey Survey) is sent to participants to evaluate the demographic (new or experienced endurance athletes, current plant-based consumption or those interested in consuming a plant-based diet, and type of endurance event), the level of knowledge as it pertains to specific energy consumption before, during, and
after training/racing, as well as participant confidence level of successfully knowing how much to consume.

At the end of the mini-seminar, participants are asked several (1-3) questions pertaining to the content of the demonstration. The person with the correct answer wins a prize (such as a Vega Shaker bottle with product, the Thrive book, or Vega Sport Endurance Bars). An example of questions is: what is the primary energy source (macronutrient) utilized by the body during exercise? The answer is: carbohydrates.

A post mini-series assessment (Monkey Survey) is sent to participants within 24 hours after attending the presentation. The goal is to assess the knowledge and confidence level of the participants, comparing pre and post evaluation results.

Four to six weeks following the last of the three-part mini-series presentations, participants will receive a follow up survey inquiring about the implementation of success of their knowledge. They will also be asked for their feedback regarding what could have been done differently in the clinic to help their knowledge, confidence, and success.

**Assignment:**
Participants are provided nutrition guidelines (handout) at each clinic: daily vegan and vegetarian nutrient guidelines as well as training and racing nutrition guidelines. After each clinic, participants are asked to journal their nutrition for a minimum of 3-5 days and to openly share with the group what they learned or discovered as a result of the nutrition tracking.
References


Appendix

1.1 Video Link

http://www.youtube.com/watch?v=1tXBVayugVI&list=PLEGueCKLZmr0j8TRb4XwI8RPo5wqK03e7

1.2 Self Evaluation

1. What was the topic of your presentation?
Fueling as a vegan and vegetarian endurance athlete, part II (of a three session mini-clinic series).

2. Describe one thing that you did well in this presentation.
I am passionate for endurance sports nutrition and my passion carries over to my knowledge of the topic and ability to enjoy myself when presenting. Through my passion for endurance nutrition, I feel I demonstrate enthusiasm and have an ability to connect with others.

3. Describe one thing that you would change about your preparation of this presentation.

Given the time limit and technical illiteracy on another persons computer, when I run into any technical difficulties I’ve learned that I need to add lib, not go rely on my power point, and move directly into teaching based upon the goals and objectives – to move directly to the point in order to obtain the results I am seeking (based upon the objectives).

4. Comment on the content of your presentation: do you feel that you provided your audience with information that they did not know prior to your presentation?

Yes, I do feel that my presentation provided information that the audience did not know prior to December 3. The audience members were asked to fill out a pre assessment and post survey pertaining to their knowledge of nutrition for endurance performance. The pre assessment demonstrated that audience members selected carbohydrate and protein as the main energy source during exercise. However, in the post assessment, participants indicated that the role of carbohydrates was to 1) replace lost energy during exercise/training and 2) to supply energy to working muscles. This indicates that the role of carbohydrates during exercise and training is better understood than before the presentation. However, the post assessment still shows a belief that protein also plays a role during exercise/training at high intensities. This tells me that I need to pay importance to explaining the roles of the various macronutrients during exercise [intensities].

5. Comment on your eye contact. Was it sufficient? Why or why not?

Yes, I felt my eye contact was sufficient. Being able to see my audience and make eye contact offers me visual cues of their attention, comprehension, and interest. Because I prefer to “be” with the audience, rather than be behind a podium, Perhaps this will be the motivation that has me know my topic through and through rather than rely on a power point or notes to cue the speaking points.

6. Comment on your gestures and movement. Were they effective? Why or why not?

My gestures engage others and I feel they were effective. I like using my body to point to something referred within the power point or to walk from one side of the stage to another in order to connect with both sides of the room. That said, I noticed that I spent more time on one
side of the room than the other and as a result, I was not in view of the video camera. Next time, I will understand the video camera range and stay within it.

7. Comment on your practice for this presentation: did you practice thoroughly? If you feel that you did not practice thoroughly, how will you modify your practice for your next presentation? Be specific.

Locating my files on a different computer was never rehearsed- everything looked so different – I was lost on a new the desktop. That said, I’d be better off using a flash drive or to minimize the use of a power point altogether. I was able to bring the presentation down to 8 minutes (with the video) during rehearsals (while writing the presentation, in my car, speaking into a voice recorder, and riding my bike). Rehearsals began at least three weeks prior to my presentation because I knew that I had to nail this topic in less than ten minutes. I love talking, but I digress and then, poof! Time is wasted. The modifications I will make include nailing the teaching goals within the allotted time and to allow myself bumper room in case I do digress.

8. Please provide an overall assessment of your presentation. Were you satisfied with your presentation? Why or why not?

Initially, no, I was not at all satisfied. Classmates were so encouraging, but I was so disappointed in my mismanagement of locating my files. I also recognize how much time is taken when I digress on point not outlined in my rehearsed speech. But after viewing my video, and knowing what I need to change, I feel better about my performance- I was not as bad as I thought. When I see myself, I see a professional. Today, I am 84.3 percent satisfied with my performance, whereas on Tuesday I experienced zero satisfaction.
1.3 My Vegan Plate

**Nutrition Tips:**
*Choose mostly whole grains.*
*Eat a variety of foods from each of the food groups.*
*Adults age 70 and younger need 600 IU of vitamin D daily.*
*Sources include fortified foods (such as some soymilks) or a vitamin D supplement.*
*Sources of iodine include iodized salt (3/8 teaspoon daily) or an iodine supplement (150 micrograms).*
*See www.vrg.org for recipes and more details.*

**Vitamin B12:**
Vegetarians need a reliable source of vitamin B12. Eat daily a couple of servings of fortified foods such as B12-fortified soymilk, breakfast cereal, meat analog, or Vegetarian Support Formula nutritional yeast. Check the label for fortification. If fortified foods are not eaten daily, you should take a vitamin B12 supplement (25 micrograms daily).

**Note:**
Like any food plan, this should only serve as a general guide for adults. The plan can be modified according to your own personal needs. This is not personal medical advice. Individuals with special health needs should consult a registered dietitian or a medical doctor knowledgeable about vegan nutrition.
1.4 Sample Pre Assessment

In a typical week, how many days do you exercise?

- I don't regularly exercise (30%)
- Once a week (16.67%)
- 2 to 4 days a week (50.00%)
- 5 to 7 days a week (6.67%)

Have you ever participated in an endurance event (i.e., an event lasting longer than 90 minutes, such as a 10k run, half marathon, sprint triathlon, metric century ride)?

- Yes (30%)
- No (70%)

https://www.surveymonkey.com/s/anycofo90PNWoG709ap0G9zpGz57H1yq2qG3fInAe7xR86m-PBG0_3D
1.5 Sample Post Assessment

You’ve just run a half marathon (13.1 miles) and it’s time for your recovery meal. When is the most optimal time to replenish carbohydrate (glycogen) stores and what is the most optimal recovery meal/snack?

Answered: 3  Skipped: 0

Answer Choices
- Burger with cheese, fries, and...
- Banana and chocolate "milk" w...
- Wait to eat three slices of combo...
- If I’m not hungry, I won’t eat

Responses
- 0% 0
- 100% 1
- 0% 0
- 0% 0

Total Respondents: 3

Which macronutrient does the body primarily utilize during efforts of high

https://www.surveymonkey.com/analyze/im tVY5epkDskD3XDFA28cNRyeCnyo_2B045Qp3e0MpdYEl_3D