Introduction

- Runners often aim to keep total energy intake low to reduce body fat and weight; however, evidence shows that even runners who don't consciously restrict intake may exhibit an energy deficit due to the energy-demanding nature of this sport (Deldicque & Francaux, 2015).
- Male and female runners train up to 60 and 100 miles per week, respectively. Daily calorie intakes are usually not enough to support their exercise energy expenditures.
- The relationship between an athlete's energy status, hormone function and bone metabolism is highlighted by the female athlete triad (Triad), a condition involving low energy availability (EA), with or without disordered eating; menstrual dysfunction; and low bone mineral density (BMD) (Nativé et al., 2007).
- Nutritional deficits combined with repeated weight-bearing exercise compromises bone health and increases the susceptibility to fractures (Barrack et al., 2014).
- An evidence-based nutrition app and messaging system may aid in providing access to a population of endurance runners already utilizing their smart phones, to provide personalized nutrition information and optimize their energy status.

Purpose

Develop nutrition resources aimed at optimizing energy status in male and female collegiate endurance runners. Specifically, this project includes personalized meal plans and a post-workout meal suggestion matrix that will be featured within a goal-based smartphone app called “Run Fueled.”

Methods

Nutrition Resource Procedures
- According to the ACSM and AND, a post-exercise snack consumed after a glycogen-depleting workout should contain approximately 60 – 75 g CHO, 6 – 12 g PRO and minimal (<5-10 g) FAT to replenish glycogen and repair and rebuild muscle. Table 1 is the snack matrix in this project.
- Calorie and macronutrient information for each type of food were verified using the United States Department of Agriculture (USDA) Nutrient Database.
- This project includes 20 unique meal plans that provide energy and macronutrient-specific recommendations for athletes based on their body weight and specific weekly running mileage.
- There are five main plans based on training volume and intensity, as shown in Table 2.
- Each of the five plans include four meal plans for the following body weight categories: 45 kg, 55 kg, 65 kg and 75 kg. The procedure used to calculate needs for the athletes represented in each meal plan was similar, with the exception of different nutrient requirements for each plan.
- Tables 3–5 show the process for a 45kg athlete on Plan A.

Results

Nutrition Resource Modifications
The following items were suggested by the experts, and therefore modified within the nutrition resources:
- Specific modifiers such as “whole grains,” and “low-fat” dairy
- Better organization of meals, including meal descriptions, such as “burrito,” or “water sandwich”
- Instructions for cooking preparation, such as “cooked” or “uncooked” oats
- 3 oz protein at dinner in 4 meal plans
- Milk alternatives listed in the Appendices
- Exchange list for reference in the Appendices

Evaluation by Experts
- An expert review panel of registered dietitians and athletic professionals reviewed the nutrition resources to provide feedback in a Formative Evaluation Survey.
- On average, experts tended to choose “agree” or “strongly agree” with the evaluation items, indicating that the nutrition resources would be appropriate and effective for the target audience.
- All three experts stated that they would recommend these resources to professionals and athletes in the future.

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For more information
Please contact bellison525@gmail.com.

References