Physical Activity in the Treatment of Eating Disorders

by Valerie Carpenter, MS, RD and Natalie Bessinger, MS, RD

Exercise in the treatment of eating disorders (ED) remains a controversial issue. For the general population, physical activity is an important way to reduce risk factors for conditions such as heart attack and stroke, as well as to improve mood and mental health. However, in the ED population, exercise can become a means of perpetuating the illness. Introducing activity back into an individual’s life while in ED treatment can be beneficial in the long term for overall well-being, focusing more on the enjoyable activity or pleasurable movement and less on the drive to burn calories. It is imperative that activity is reintroduced appropriately and under the guidance of a comprehensive treatment team, which can help the patient reframe his or her idea of exercise and its purpose.

Benefits of Physical Activity in Eating Disorders

At certain stages of an individual’s ED, exercise can become a rigid and time-consuming behavior, undertaken with the intention and drive to manipulate one’s body shape, size, and weight. The National Eating Disorder Association defines compulsive exercise as “exercise that significantly interferes with important activities, occurs at inappropriate times or in inappropriate settings, or when the individual continues to exercise despite injury or other medical complications.” Exercise then becomes a behavior of the illness in the form of purging. Despite general assumptions, purging does not refer only to physically vomiting as a means to get rid of caloric intake; rather, purging is defined as “behavior to influence weight or shape,” including laxative abuse, misuse of diuretics, and compulsive exercise.

Physical Benefits

Physical activity can be beneficial in the physical rehabilitation of the body during ED treatment, despite the controversy that surrounds its inclusion in various treatment modes. Physical activity can assist in both the physical and psychological rehabilitation of a patient, as well as provide constructive social reintegration. Physically, movement can be used as physical therapy to help rebuild bone...
density lost due to prolonged malnutrition. Osteopenia and osteoporosis—the loss of bone mass—are common coexisting health problems in the ED population. A diet rich in calcium and vitamin D as well as weight-bearing activity are used in the management of osteoporosis. Bone is living tissue in which old cells continually break down and new tissue is formed. Weight-bearing exercise performed on a regular basis helps rebuild more bone cells and strengthen bone as a result of the bone adapting to the impact of weight and pull of muscle.

In addition to favorably impacting bone health, physical exercise might aid in restoring gastric motility during the physical rehabilitation of a patient’s gastrointestinal (GI) tract, a system that is often damaged as a result of eating disorder behaviors. Typically, patients spend the majority of their time during a treatment day being sedentary in group and individual therapy sessions; therefore, the addition of movement could be beneficial. Incorporation of physical activity in an inpatient psychiatric setting has been shown to improve GI motility in patients.

Psychological Benefits

Psychologically, physical activity is often used as an anxiety and stress management tool. Biochemical changes can occur as consequences of the ED, including alterations in serotonin and norepinephrine levels. Activity may help regulate brain chemistry via release of endorphins and other neurochemicals in patients with disordered eating. Physical activity is also frequently used to help patients make progress on body awareness and acceptance. A patient can also start to have positive associations between his or her physical body and its capabilities beyond mere physical appearance. Patients who begin an activity program while in treatment may become less rigid in attitudes and beliefs around exercise, which may also allow for improved weight restoration. Future research should be conducted to determine if movement and physical activity can help patients who suffer from body image dysmorphia, or the altered perception of their physical selves, generate realistic perception of their bodies and improve body image dissatisfaction.

Social Benefits

Socially, persons with EDs tend to isolate themselves. Be it due to shame of their behaviors, discomfort with their physical appearance, or general social anxiety, people who suffer from EDs may withdraw from social settings. Physical activity, especially if done in a group setting, can be a way to foster reintegration into society in a controlled, social, and safe environment.

How to Begin Physical Activity in Treatment

Nutritional Status

Physical activity must not be included in ED treatment without medical authorization and guidance. Due to the potential severity of physical complications that often occur with malnutrition, activity can be very dangerous if not reintroduced appropriately. Laboratory values should be checked often to monitor physical and nutritional status; these studies include measurement of glucose, electrolytes, and protein status. Also, physical activity should not be included if the patient is already struggling to restore weight at an appropriate rate. In addition, it is important to keep in mind that a patient’s nutritional intake will need to change to reflect the increase in movement to ensure continued nutritional rehabilitation.
If It Ain’t Broke…

by Mark Kern, PhD, RD, Editor-in-Chief

Even if “it ain’t broke,” it doesn’t mean that a little routine maintenance isn’t in order. Our hope at PULSE is that by reading this issue, you’ll be able to tinker around the edges with maintaining your knowledge in nutrition and dietetics.

On the cover you’ll find a compelling article by Valerie Carpenter, MS, RD and Natalie Bessinger, MS, RD about the potential benefits that physical activity can provide during eating disorder treatment. You can also explore, in this issue’s free CPE article provided by Floris Wardenaar, PhD and Corrie Whisner, PhD, the possible role that nutrition professionals may have in influencing clients choosing to use or not use dietary supplements. If you would like to learn how your perceptions and practices regarding various dietary fats compare with those of registered dietitians, you’ll want to see what Sherri Stastny, PhD, RD, CSSD, Jill Fabricius Keith, PhD, RD, Nicole Vasichek, MS, RDN, and Julie Garden-Robinson, PhD, RD discovered in their research. In our final feature article, Lindsay Howard, MS and Angela Hillman, PhD provide a study investigating the impact of hydration on cognition and skill during basketball simulation.

Another great way to maintain your knowledge about SCAN activities and other happenings in the field is by reading about news from our subunits and other notices in our “Of Further Interest” section, taking a look at the notable accomplishments of our members, and perusing PULSE’s “Conference Highlights,” “Research Digest,” and “Reviews” sections.

take to support each new activity incorporated. Therapists can work to ensure the patient is not viewing his/her movement through an ED filter. Processing the activity each time something new is added can help the individual better understand the emotions, thoughts, and physical response to that activity. Physicians and/or nurses monitor medical status through laboratory results and the patient’s vital signs. Incorporating all members of the treatment team ensures that all areas of well-being are evaluated and addressed.11

Types of Recommended Physical Activities

The types of activity introduced in treatment can have profound effects on the well-being of the patient. It is important to start with minimal impact movements. This helps the body adapt to the increase in exertion. Activities such as gentle stretching yoga, progressive muscle relaxation, and Tai Chi are examples of low-impact movement modalities. Starting with gentle movement can help the patient work on layering on each new activity as a way to control exposure to different stressors. These gentle types of movement are a good way to work on starting to learn control around breathing and being present in the activity, instead of focusing on burning calories. Once medically appropriate, the patient can begin to look at adding other forms of physical movement.

Team sports are a highly recommended way to move forward in reintegration of physical activity for a number of reasons. First, there is always a coach or other team members present to assist in monitoring the patient for appropriate movement. This type of accountability can be very helpful for patients, especially those who have a history of hiding exercise and movement. Team sports are also time-limited and often have a set schedule of practices and games, which might help to ensure avoiding extra movement. Furthermore, team sports will address social reintegration and can build a sense of self within a group setting. Teammates can provide positive social influences with healthy attitudes towards different body shapes and sizes. Examples of other recommended activities would be rock climbing, volleyball, and softball; these are all sports that do not emphasize appearance, weight requirements, or endurance.12

Conclusions

Physical activity can be a beneficial therapeutic intervention in the treatment of ED. Often the use of exercise as an unhealthy coping skill or purging mechanism in EDs can be difficult to address due to societal beliefs about the value of exercise. It is important to focus on reframing physical activity as a therapeutic intervention instead of as a means for manipulating the body. Physical activity can be a way to challenge body distortions, improve physical health, and confront psychological beliefs, but only if done under the supervision of an experienced interdisciplinary treatment team. Learning to incorporate activity while in treatment can be a beneficial tool, and it can serve as motivation for recovery as an outpatient.

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Impact of Dietary Counseling on Use of Dietary Supplements and Sport Nutrition Products

by Floris Wardenaar, PhD and Corrie Whisner, PhD

This article is approved by the Academy of Nutrition and Dietetics, an accredited Provider with the Commission on Dietetic Registration (CDR), for 1 continuing professional education unit (CPEU), level 1. To apply for free CPE credit, take the quiz on SCAN’s Web site (www.scandpg.org/quiz/?id=91). Upon successful completion of the quiz, a Certificate of Completion will appear in your My Profile (under the heading, My History). The certificate may be downloaded or printed for your records.

Learning Objectives

After you have read this article, you will be able to:

■ Name the types of supplements that were more likely to be used by athletes after dietary counseling, according to a recent Dutch study.

■ Discuss the results of this Dutch study regarding which type of supplements were inversely related to dietary counseling.

■ Describe the challenges that athletes face in selecting nutritional supplements.

The use of nutritional supplements among the general population worldwide has grown steadily in recent years, largely due to interest in improving health.1 From the athlete’s perspective, the belief that these products will help to improve exercise performance is considered the main driver for supplement use. This article discusses recent research on the topic of nutrition counseling and supplement use among athletes and provides practical commentary for the practitioner.

Supplement Use Among Athletes

Nutritional supplement use is nearly twice as common among athletes compared with the general population. According to self-reported data, the prevalence for nutritional supplement use is as high as 100% among

References


elite athletes and 87% among nonelite athletes.\(^4\)\(^5\)

Despite the popularity of nutritional supplements among athletes, professional organizations that are focused on sports nutrition advocate a “food-first” approach to meeting the nutritional demands of training and competition.\(^6\) Therefore, athletes should strive to optimize their general dietary intake before incorporating nutrition supplements.

**Classification of Nutritional Supplementation**

Nutritional supplements are products for oral consumption that add to the nutritional value of the habitual diet.\(^7\) Different classifications are used to characterize these products, but generally nutritional supplements can be organized into three overarching groups. The largest of these categories comprises dietary supplements—products containing one or more vitamins, minerals, or bioactives (e.g., essential fatty acids, carotenoids, and other nutritional extracts) intended to improve general health through the prevention and treatment of nutrient deficiencies. A second category of nutritional supplements frequently used by athletes entails sport nutrition products that deliver energy, electrolytes, or building blocks for training adaptation and recovery (e.g., sports drinks, recovery drinks, and energy and protein bars).\(^7\) These products often contain carbohydrates and protein, and provide a practical and/or convenient alternative to regular food. The third category is ergogenic aids, which is a constantly evolving group of supplements that have performance-enhancing claims. Examples of these are caffeine and creatine.\(^7\)

**Dietary Counseling and Supplement Use by Athletes**

Results from an unpublished part of a survey of Dutch elite and subelite athletes (n=778) and athletics staff members (e.g., coaches and medical/training staff, n=278) identify sports dietitians or nutritionists as the main experts in the field of sports nutrition. However, previous studies report that only a small proportion of athletes (10%-14%) consider a dietitian or nutritionist as their primary source of nutrition information.\(^8\)\(^9\)

Even though dietary counseling has been shown to have a beneficial effect on the food intake of athletes,\(^10\)\(^11\) many athletes decide to use nutritional supplements without consulting a health professional, such as a dietitian.\(^8\)\(^12\)

“...previous studies report that only a small proportion of athletes (10%-14%) consider a dietitian or nutritionist as their primary source of nutrition information.”\(^8\)\(^9\)

Despite the growing interest in dietary supplements by athletes, no investigations prior to 2017 have focused on evaluating whether nutritional supplement use among athletes is associated with dietary counseling. More recently, however, a study involving elite and subelite Dutch athletes examined this topic.\(^4\)

In this study, 778 athletes (407 males and 371 females, ages 24.7±9.6 years) completed a Web-based questionnaire (The Qualtrics Research Suite, 2013. Provo, UT) regarding their use of nutritional supplements. The questionnaire was designed using previous athlete-focused surveys\(^13\)\(^14\) and was expanded to include questions about dietary counseling. Among the athletes surveyed, 97.2% had used nutritional supplements at some time during their sports career, and 84.7% indicated having used supplements during the preceding 4 weeks. A total of 43% of the respondents were currently receiving dietary counseling. The products with the highest reported prevalence of use in the dietary supplement, sports nutrition products, and ergogenic aids categories were multi-vitamin and/or mineral preparations (42.9%), isotonic sports drinks (34.1%) and caffeine (13.0%), respectively.

The study found that the number of supplements consumed over the previous 4 weeks by athletes receiving dietary counseling (5.0 ± 4.4 supplements) did not significantly differ from those consumed by athletes not receiving dietary counseling (4.4 ± 4.8 supplements). Interestingly, after adjustment for elite status, age, and weekly exercise duration, dietary counseling was significantly associated with a higher prevalence of use of vitamin D (27.2% vs. 15.0%), recovery drinks (43.7% vs. 26.0%), energy bars (29.8% vs. 22.4%), isotonic sport drinks with protein (15.7% vs. 7.4%) and dextrose (12.0% vs. 7.6%), beta-alanine (7.2% vs. 2.7%), and sodium bicarbonate (1.8% vs. 0.0%).

In contrast, dietary counseling was inversely associated with the use of energy drinks (27.4% vs. 21.4%), multivitamins and/or minerals (10.5% vs. 14.6%), branched-chain amino acids (BCAA) and other amino acids (10.8% vs. 6.9%), calcium (3.3 vs. 7.8%), vitamin E (4.0 vs. 6.0%) vitamin B2 (1.2 vs. 2.5%), and retinol (0.9 vs. 2.0%).

**Better Informed Decision-Making**

In looking at the study results, the investigators observed a different pattern of nutritional supplement use among athletes receiving dietary counseling compared with athletes not receiving dietary counseling. Supplements that could be listed as useful for enhancing performance\(^15\) such as vitamin D, recovery drinks, beta-alanine, and sodium bicarbonate...
were more frequently reported by athletes receiving dietary counseling, suggesting that dietary advice may improve the dietary behaviors of competitive athletes and thereby benefit their performance.

Although the study corrected for competition level (e.g., being an Olympian athlete or not), it might be speculated that use of nutritional supplements by elite status holders are influenced by the organization of the athletes’ team staff and financial and sponsor resources, rather than by training characteristics. Whether or not this is completely beneficial needs to be considered further, but at least there seems to be more attention for these type of products on the higher level.

Evidence-Based Use of Supplements

The higher use of specific supplements by those Dutch athletes who received nutritional counseling may have been driven by broader supplement trends and recent scientific contributions. Vitamin D, for example, has recently regained interest in the sports community, as many athletes appear to be vitamin D-deficient. Other examples are the use of sodium bicarbonate and beta-alanine, which have gained increasing support following recent meta-analyses.

Because nutrition professionals are required to stay abreast of current and emerging evidence, the findings of the Dutch study may reflect evidence-based recommendations given to athletes who seek regular dietary counseling. Few studies have related athlete supplement use to specific advice given during nutritional counseling; therefore, further investigation is recommended to provide clarity on the potential effect of this advice on actual behavior.

Habitual Versus Actual Daily Use

While the Dutch study provides an indication of frequently used nutritional supplements among athletes, it does not yield insight regarding daily supplement use. In contrast, a prior study from the Netherlands provides more specific information on athletes’ daily use. Findings from that study indicate that, based on multiple 24-hour recalls, specific daily use of nutritional supplements was approximately one-third lower than habitual use of supplement intake over the past 12 months.

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Although the combining of information gathered from a food-frequency questionnaire with that from a multiple-day food diary gives a better perspective on daily and habitual use, estimations of day-to-day use of these nutritional supplement products are limited. This makes it extremely important for practitioners to probe and ask additional questions regarding this subject in daily practice, and to be aware of the large variation in supplement intake both among athlete groups and within individual athletes.

Importantly, the study also found that athletes using supplements were more likely to engage in weight control practices. This suggests that athletes may be using supplements to manage their weight, further highlighting the need for education and counseling on healthy weight management.

Supplement versus Food Intake

Research suggests that athletes have a largely positive attitude towards nutrition but only limited knowledge of the subject. Furthermore, nutrition knowledge, beliefs, and practices are extremely diverse in the field of sports, which emphasize the importance of involving a sports dietitian.

While self-reported use of nutritional supplements by athletes may be associated with dietary counseling, other factors also play a role in supplement use. Supplements can be costly, making dietary and whole food approaches more cost-effective methods of improving intakes of specific nutrients. Therefore, it is important that athletes make good food choices to avoid dependence on supplements when they are not truly necessary.

Equally important is the fact that successful selection of a high-quality diet depends on a wide variety of factors. For this reason, dietitians need to check in regularly with their clients to make sure that athletes are continuing to achieve adequate nutrient intakes from food and dietitians are recommending supplementation only when needed.

Periodization and Dose Differ by Supplement Type

Supplementation regimens require oversight by nutrition professionals, because in some cases supplements provide either far more than the recommended daily amounts or no additional benefit when consumed outside of the competition season or training periodization. When recommending ergogenic or rehydration aids, sports dietitians may advise limiting their intake so that a whole food approach can be implemented to provide a wide variety of required macro- and micronutrients. In the case of high-dose supplements (servings that provide more than recommended daily intakes), dietitians can recommend intermittent (e.g., weekly or biweekly) supplementation. On the other hand, when athletes use...
low-dose multivitamins, daily use can be recommended for optimizing nutritional status and athletic performance.\textsuperscript{20}

Interestingly, supplement use may not always correct nutritional inadequacies, particularly for nutrients such as vitamin D and iron.\textsuperscript{20,23} Therefore, dietitians should advise complementing supplement intake with the athlete’s dietary intake of key nutrients, promoting higher dietary intakes or increased supplementation when necessary to meet recommended needs.

**Challenges with Supplement Selection**

When maintaining a food-first approach, supplements may be necessary for some athletes to achieve recommended intakes of certain micro- and macronutrients to facilitate optimal health and performance. As the supplement market continues to grow, it may become difficult for athletes to identify the most appropriate, effective, and safe supplements for their individualized needs. Supplements have been found to lack ingredients listed on the label or contain contaminants or banned substances; these shortcomings can negatively affect the athlete.\textsuperscript{24,25}

In light of such problems, sports dietitians are a critical resource for athletes in selecting products. These professionals can be helpful in identifying brands, specific formulations, and supplementation regimens that are cost-effective and meet the athletes’ needs while limiting the risks of over- or under-consumption of nutrients and adverse events.

**Connecting Research and Daily Practice**

Implementing research tools as a part of an athlete’s daily routine would enable sports dietitians to continuously monitor processes. Moreover, these tools would facilitate longitudinal research in this area and evaluation of nutritional supplement intake over time at different phases of training and competition. Implementation of such a strategy requires an interdisciplinary approach within professional or intercollegiate sports teams.

Generally, athletes and their coaches are most likely to be willing to participate when they are assured that they will receive feedback quickly. Therefore, it is important to prioritize efficient evaluation and reporting of survey or other data that can be provided to athletes.

**Conclusion**

Current findings confirm the widespread use of nutritional supplements by competitive athletes, and also underline that dietary counseling plays an important role in the choice and use of specific nutritional supplements. More specifically, athletes receiving dietary counseling seem to make better choices regarding nutritional supplement use when compared with athletes not receiving dietary counseling. Although there exists a relation between the intake of specific nutritional supplements and dietary counseling, current evidence does not provide a clear understanding of how and when these products are used (e.g., daily use of a multivitamin instead of incidental use; competition use vs. habitual use). Therefore, it is suggested to combine multiple strategies in daily practice to obtain a complete view of actual dietary supplement use in individuals.

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**References**


Dietary Fat Recommendations: Registered Dietitian Nutritionists’ Practices and Guidance Vary

by Sherri N. Stastry, PhD, RD, CSSD; Jill Fabricius Keith, PhD, RD; Nicole Vasichek, MS, RDN; and Julie Garden-Robinson, PhD, RD

Introduction

In the 1940s, when coronary heart disease (CHD) first became the leading cause of death in the United States, scientists began to search for causes.1 Low-fat diets became customary in the U.S. as obesity rates increased and a national focus on weight loss emerged.2 The desired outcome of low-fat diets was to aid in weight reduction and reduce coronary heart disease (CHD) risk. The “diet-heart” hypothesis was formed, stating that diets high in saturated fatty acids (SFAs) and cholesterol were a major cause of CHD.3

In 1980, when the first Dietary Guidelines for Americans (DGA) were released, avoidance of too much fat, SFAs, and cholesterol was suggested.4 The 1980 DGA indicated that consumption of excess SFA and cholesterol would increase serum cholesterol levels in most people. However, this reaction was expected to vary due to heredity and individual response to cholesterol.2 These recommendations were proposed because CHD was the leading cause of death in the U.S. at the time.5 However, conclusive nutritional data to justify these recommendations were lacking when the 1980 DGA were released.6

In 1960, U.S. individuals consumed approximately 45% of their caloric in-
take from fat. By 1995, dietary fat consumption had dropped to about 35% of caloric intake.5-7 Despite decreased fat intake, CHD remained the leading cause of death in the U.S. for both men and women. About 13% of adults were obese and less than 1% had type 2 diabetes related to obesity in 1960; in contrast, more recently 35% of adults are obese and 9% have type 2 diabetes.8

Subsequent DGA releases continued with an emphasis on either “low fat” or “fat in moderation” recommendations.6 The 2000 DGA stated to “use fats sparingly.”9 The 2005 and 2010 versions of the DGA shifted fat recommendations to 20% to 35% of total kcal from fat kcal.9 Other national health organizations have varied guidance for dietary fat, and to date, recommendations are not consistent (as shown in Table 1). Since the study reported here was conducted, the DGA 2015-2020 were released and emphasize a healthy eating pattern, which includes oils and limits SFA and trans fats.10 Furthermore, the new DGA states, “…evidence shows that replacing SFA with polyunsaturated fats is associated with a reduced risk of CVD...”

Registered dietitian nutritionists (RDNs) are expected to stay current on changing nutrition science and dietary recommendations. However, staying current has been a challenge as some evidence points to a lack of nutritional science backing up former dietary fat guidelines and subsequent consumer confusion.4 One study indicated that consumer confusion is associated with exposure to conflicting information regarding the health benefits and risks of foods and their belief that nutrition scientists keep changing their minds.11

Table 1. Various Professional Recommendations for Total Fat and Different Fatty Acids as of December 2016

<table>
<thead>
<tr>
<th>Group</th>
<th>Total Fat</th>
<th>PUFA</th>
<th>MUFA</th>
<th>SFA</th>
<th>TFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Heart Association, 2015</td>
<td>25%-35% of total kcal</td>
<td>Majority of fat kcal</td>
<td>Majority of fat kcal</td>
<td>&lt;7% or 5%-6% of kcal for those trying to lower LDL cholesterol</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>National Lipid Association, 2014</td>
<td>Low-fat diet recommended for individuals with high triglycerides</td>
<td>Partially replace refined CHO intake with unsaturated fats to ↓ triglyceride levels and ↑ HDL cholesterol</td>
<td>Partially replace refined CHO intake with unsaturated fats to ↓ triglyceride levels and ↑ HDL cholesterol</td>
<td>Reduce dietary intake due to high SFA diet’s association with increased LDL levels</td>
<td>↓ trans fatty acid consumption</td>
</tr>
<tr>
<td>Dietary Guidelines Committee, 2015</td>
<td>Emphasis on adequate fat consumption ↓ fat diets are not related to reduced CVD risk.</td>
<td>Replace SFA with unsaturated fat, especially PUFAs</td>
<td>Limited evidence supporting reduced CVD risk with replacement of SFA with MUFA</td>
<td>Retain upper limit of 10% of kcal</td>
<td>Avoid partially hydrogenated oils</td>
</tr>
<tr>
<td>Academy Evidence Analysis Library position paper, 2014</td>
<td>20%-35 % of total kcal</td>
<td>↑ PUFA consumption with a focus on n-3 intake while striving to consume ≥2 servings of fatty fish per week</td>
<td>Moderate intake of MUFA (15%-20%)</td>
<td>&lt;7%-10% of kcal</td>
<td>Intake as low as possible</td>
</tr>
</tbody>
</table>

Academy=Academy of Dietetics and Nutrition; CVD=cardiovascular disease; CHO=carbohydrate; HDL=high-density lipoprotein; LDL=low-density lipoprotein; MUFA=monounsaturated fatty acids; PUFA=polyunsaturated fatty acids; SFA=saturated fatty acids; TFA=trans-unsaturated fatty acids.
As recently as 2010, when the DGA included 20% to 35% of kcal from fat, Jakobsen and Hu found that most people restrict fats as a whole regardless of classification as “good” or “bad.” In addition, when fat is restricted, processed carbohydrate-rich foods such as bread, sugary drinks, or fat-free products often are the replacements.

While SFA and trans-unsaturated fatty acids are targets for reduction or avoidance, monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA) should be included as part of a balanced diet. RDNs are key to spearheading needed shifts in dietary fat consumption among healthy consumers, and consumer trust in their efforts will be more effective with consistency in recommendations. Consumer confusion may be partially influenced by mixed messaging from health educators (e.g., RDNs). The purpose of this study was to assess perceptions, nutrition knowledge, and personal dietary practices regarding fat recommendations among a random sample of RDNs.

Methods

Subjects

In July 2015 (prior to the release of the DGA 2015-2020), RDNs were recruited to participate in an electronic Fat Facts survey via the Commission on Dietetic Registration (CDR). A request was made to CDR to provide the maximum number of participants allowed by the CDR complimentary sample list to students who are completing a research project. The sample of RDNs was randomly chosen by CDR from the pool of RDNs registered to receive the CDR listserv. After the participants received the URL, they were directed to the informed consent form where instructions on survey completion were provided. The North Dakota State University Institutional Review Board approved the study protocol before recruitment began. A $20 Amazon gift card was randomly awarded to one of the first 150 survey completers.

Survey Design

The Fat Facts survey, which was inspired by the Social Ecological Model used for this cross-sectional study, was designed to establish a baseline of knowledge and awareness as well as estimate current practice of dietary fat recommendations among a random sample of RDNs. The survey addressed dietary patterns and nutrition knowledge for fats and types of fats consumed using a five-point Likert-type scale (ranging from “never” to “always”; “very important” to “not important at all”; “strongly agree” to “strongly disagree”) that were converted numerically to assess strength of responses. Respondents were asked to rate their level of agreement that olive oil, canola oil, vegetable oil, vegetable oil spray, butter, margarine, coconut oil or other fats should be regularly used in food preparation. Demographic data were also collected. Measures of perceived confidence in making recommendations regarding dietary fat (e.g., trans fat, SFA, PUFA) were assessed using a Likert-type scale (5=very confident, 4=confident, 3= somewhat confident, 2=unsure, 1=very unsure). For example, participants were asked, “Indicate your level of confidence in choosing foods that contain fats that are associated with health benefits.” Participants were also surveyed on their personal use of fish oil and coconut oil and their likelihood to recommend the oils to the general public.

The survey was pilot-tested with 12 RDNs in a variety of practice settings including clinical, education, and community to test for face validity. For feedback regarding ease of use, ease of time to completion, and suggestions for improved understandability and readability, the pilot-testing contributed to changed survey questions before the Fat Facts survey was delivered to the CDR sample. After pilot-testing, five questions were modified, one question was deleted, and two questions were added to the finalized survey.

Statistical Analysis

Descriptive statistics were utilized to detail RDN recommendations regarding total and other fats. Influence of RDNs’ personal dietary habits on professional practice recommendations were determined using logistic regression analysis. Analysis of variance (ANOVA) statistics for comparison by area of dietetic practice was completed to detail RDN level of confidence when making dietary fat recommendations. The Bonferroni correction for multiple testing was utilized. Duncan’s multiple comparisons were done to determine specific mean differences between RDN personal level of confidence in explaining fat’s effects on health among different areas of practice. The alpha value was set at 0.05. All statistics were performed using SAS Institute Inc. 9.3, 2011 (Cary, NC).

Results

The Fat Facts survey was initially emailed to 2,500 randomly selected RDNs enlisted in the CDR listserv (possible 94,473 members in 2015). Of those emails sent, 29 emails bounced back, bringing the final sample to 2,471 potential candidates. The survey was re-sent three times to maximize exposure. Potential participants were allowed to complete the survey only one time using the ballot-box-stuffing-prevention feature in Qualtrics. A total of 281 completed surveys were returned (11% response rate). Demographic information shows that the majority of the participants were females, similar to overall CDR membership (96% are female), and between the ages of 25 and 60 years (Table 2).

Responses regarding agreement that specific fats should or should not be used regularly in food preparation are shown in Table 3. Overall, of the seven dietary fats listed on the survey, olive oil received the highest rating, with an average weighted mean (WM) score of 4.62 (highest possible: 5.00). Margarine was rated the least acceptable to be used in food prepa-
Table 2. Study Participants: Sex, Age, and Practice Areas of RDNs Responding to the Fat Facts Questionnaire*

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>n</th>
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<tbody>
<tr>
<td><strong>Sex (n=280)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>97</td>
<td>271</td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td><strong>Age (n=281)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Under 18</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18-24</td>
<td>3</td>
<td>8</td>
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<tr>
<td>25-39</td>
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<td>40-60</td>
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<td>102</td>
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<tr>
<td>61 or older</td>
<td>12</td>
<td>34</td>
</tr>
<tr>
<td><strong>Primary area of practice (n=281)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical nutrition-acute care/inpatient</td>
<td>22</td>
<td>61</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>53</td>
</tr>
<tr>
<td>Clinical nutrition ambulatory care</td>
<td>16</td>
<td>45</td>
</tr>
<tr>
<td>Community</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Education and research</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Consultation and business</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td>Clinical nutrition-long-term care</td>
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<tr>
<td>Food and nutrition management</td>
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<td>13</td>
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<tr>
<td><strong>Highest level of education (any major) (n=280)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master's degree</td>
<td>48</td>
<td>133</td>
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<td>Bachelor's degree</td>
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</tr>
<tr>
<td>Doctorate degree</td>
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<td>18</td>
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<tr>
<td><strong>Years of Practice as an RDN (n=281)</strong></td>
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<td></td>
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<tr>
<td>Less than 5 y</td>
<td>21</td>
<td>58</td>
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<td>16</td>
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<td>26-30 y</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>More than 30 y</td>
<td>15</td>
<td>41</td>
</tr>
</tbody>
</table>

*Sample sizes vary slightly due to missing data

Results also showed that 72% and 31% of respondents consider mackerel and lake trout, respectively, to be good sources of n-3 fatty acids, even though both are considered to be good sources of n-3 fatty acids.16 In addition, 9.25% and 8.90% indicated that tilapia and shrimp, respectively, were good sources of n-3 fatty acids, which is untrue.16

There were significant mean differences in personal confidence and nutritional knowledge between RDN areas of practice when specifically asked about n-3 fatty acids, n-6 fatty acids, and essential fatty acids. Dun-
Table 3. Agreement That Selected Fats Should Be Used Regularly in Food Preparation Among a Random Sample of RDNs*

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree (5)</th>
<th>Agree (4)</th>
<th>Neither agree nor disagree (3)</th>
<th>Disagree (2)</th>
<th>Strongly disagree (1)</th>
<th>Weighted Mean**</th>
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</thead>
<tbody>
<tr>
<td>Olive oil (n=281)</td>
<td>179</td>
<td>97</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>4.62</td>
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<tr>
<td>Canola oil (n=278)</td>
<td>92</td>
<td>122</td>
<td>39</td>
<td>16</td>
<td>9</td>
<td>3.98</td>
</tr>
<tr>
<td>Vegetable oil (soybean, corn, etc. (n=276))</td>
<td>20</td>
<td>78</td>
<td>91</td>
<td>63</td>
<td>24</td>
<td>3.03</td>
</tr>
<tr>
<td>Vegetable oil spray (e.g., PAM) (n=276)</td>
<td>30</td>
<td>109</td>
<td>78</td>
<td>31</td>
<td>19</td>
<td>3.26</td>
</tr>
<tr>
<td>Butter (n=280)</td>
<td>24</td>
<td>103</td>
<td>75</td>
<td>77</td>
<td>1</td>
<td>3.26</td>
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<tr>
<td>Margarine (n=278)</td>
<td>1</td>
<td>26</td>
<td>54</td>
<td>113</td>
<td>84</td>
<td>2.09</td>
</tr>
<tr>
<td>Coconut oil (n=279)</td>
<td>25</td>
<td>74</td>
<td>82</td>
<td>75</td>
<td>23</td>
<td>3.01</td>
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<tr>
<td>Other fat (n=207)</td>
<td>17</td>
<td>25</td>
<td>139</td>
<td>13</td>
<td>13</td>
<td>3.10</td>
</tr>
</tbody>
</table>

*Sample sizes vary slightly due to missing data

** Mean in which each item being averaged is multiplied by a number based on the item’s relative importance ranging 1-5. The result is summed and the total is divided by the sum of the responses.

can’s multiple comparisons were used to determine specific mean differences. The mean (M) response for those practicing in Education and Research (M=4.44) was higher (P<.05) than for those practicing in Clinical Nutrition-Acute Care/Inpatient (M=4.13). RDNs practicing in Consultation & Business (M=4.67) were significantly more confident than RDNs in Food and Nutrition Management (M=4.23) in choosing foods that contain fats associated with health benefits. Regardless of these differences, all RDN areas of practice reported high levels of confidence; all means were greater than 4.0. In addition, only 19% of respondents were neutral or unsure of PUFAs’ effects on health.

Another question probed for “level of confidence in explaining each fat’s effects on health.” No significant indicators were noted regarding personal level of confidence in explaining fat’s effects on health among the different areas of RDN practice. There were no significant differences in practice groups for this question; most RDNs (92%) reported high levels of confidence (mean of 4 or higher). Regarding confidence in fat’s effect on health, 19% were “neutral”/“unsure” of PUFAs.

When asked about the impact of the then-proposed 2015 Dietary Guidelines from the DGA advisory committee, 22% of respondents agreed their confidence level for making dietary fat recommendations was decreased by publication of the committee report. However, 18% of RDNs disagreed that the proposed guidelines decreased their confidence level while making fat recommendations. In addition, 52% neither agreed nor disagreed that their confidence level has been affected. No significant differences in knowledge or confidence due to the proposed 2015 DGA were observed based on RDNs age group, level of education, and years of experience. Also, no significant differences were noted among dietetic practice groups in level of confidence in explaining attributes of n-6 fatty acids in the 2015 DGA.

Of 281 responses regarding personal
use of a fish oil supplement, 37% indicated they use the supplement and 63% indicated they do not; 40% of RDNs “rarely”/“never” recommend fish oil supplements. Despite that contrast, logistic regression analysis indicated that personal use of a fish oil supplement was a significant predictor of fish oil recommendations ($P<.0001$). The likelihood of a respondent personally using a fish oil supplement increased 3 times for every unit (“never” to “rarely” is 1-unit) increase in his/her recommendation of fish oil. For example, a respondent who “most of the time” recommends fish oil was 9 times more likely to take a fish oil supplement than a respondent who “never” recommends a fish oil supplement.

Response to the statement “RDN recommendation of increased fish consumption for a heart-healthy diet” was a significant predictor ($P=.027$) of how often RDNs recommend a fish oil supplement. This was also a categorical dependent variable, so the predictors are compared with the base levels from 1 (never) to 5 (always). The reference level was 5. RDNs who reported “always” recommending a fish oil supplement would be more likely to respond “yes” to recommending increased fish consumption.

**Discussion**

A key outcome of this study is that there is a relatively widespread lack of confidence in making suggestions to clients regarding consumption of dietary fats. Our results suggest that varying dietary fat guidelines among the professional organizations may be at least partially responsible. Many of the responding RDNs indicated that the advisory committee report for the 2015 DGA decreased their confidence level when making dietary fat recommendations. That report recommended that rather than focusing on reduction of sodium, SFA, and added sugars, emphasis should be placed on eating a healthy and balanced dietary pattern that includes oils but limits SFA and trans-unsaturated fatty acids. The current study also revealed that many RDNs make varying recommendations regarding potential health benefits of fatty acids, good sources of foods.

| Table 4. Weekly Self-Purchasing of Low-Fat Products Among a Random Sample of RDNs* |
|----------------------------------|-------------------|-----------------|-----|
|                                   | Cumulative Frequency (CF) | %               | n   |
| **Use of processed low-fat products (n=280)** |                                 |                 |     |
| Always (>5 days per week)         | 6.79               | 6.79            | 19  |
| Most of the time (3-4 days per week) | 30.00             | 23.21           | 65  |
| Sometimes (2 days per week)       | 53.93              | 23.93           | 67  |
| Rarely (1 day per week)           | 83.22              | 29.29           | 82  |
| Never                             | 100.00             | 16.78           | 47  |
| **Use of fat-free or reduced fat salad dressing (n=277)** |                                 |                 |     |
| Always (>5 days per week)         | 4.69               | 4.69            | 13  |
| Most of the time (3-4 days per week) | 18.41             | 13.72           | 38  |
| Sometimes (2 days per week)       | 30.32              | 11.91           | 33  |
| Rarely (1 day per week)           | 54.15              | 23.83           | 66  |
| Never                             | 100.00             | 45.85           | 127 |
| **Use of fat-free or reduced fat dairy substitutes, such as creamers (n=277)** |                                 |                 |     |
| Always (>5 days per week)         | 6.14               | 6.14            | 17  |
| Most of the time (3-4 days per week) | 13.00             | 6.86            | 19  |
| Sometimes (2 days per week)       | 21.30              | 8.30            | 23  |
| Rarely (1 day per week)           | 34.66              | 13.36           | 37  |
| Never                             | 100.00             | 65.34           | 184 |
| **Use of fat-free or reduced fat dairy products (n=281)** |                                 |                 |     |
| Never                             | 14.23              | 14.23           | 40  |
| Rarely (1 day per week)           | 24.28              | 9.96            | 28  |
| Sometimes (2 days per week)       | 40.65              | 16.37           | 46  |
| Most of the time (3-4 days per week) | 69.12             | 28.47           | 80  |
| Always (>5 days per week)         | 100.00             | 30.88           | 87  |

*Sample sizes vary slightly due to missing data
high in n-3 fatty acids, and avoidance of different fatty acids. While the DGA advisory committee and most RDNs in the current study recommended that trans fat should be avoided, some of the RDNs in the current study recommended SFA avoidance, which is contrary to DGA 2015-2020. Fat-containing foods possess a variety of fatty acids rather than one single type; therefore, complete avoidance of SFA is not possible. The key is to limit excess consumption of SFA. Jakobsen et al noted a positive direct association between substituting MUFAs for SFAs and risk of coronary events, but not coronary-related deaths. As science-based nutrition information is released, many RDNs strive to change medical nutrition therapy advice accordingly. The American Heart Association (AHA) recommends at least 2 servings of n-3 fatty acid (PUFAs) per week. A significant inverse relationship between substituting PUFAs for SFAs and coronary event risk and overall coronary death has been reported in the literature. In addition, a direct negative association has been observed between carbohydrate substitution and risk of coronary events. The DGA 2015-2020 clearly state that SFA should be limited and replaced with PUFAs and MUFAs.

When RDNs in the current study were asked which fats provide potential health benefits, most respondents agreed that n-3 fatty acids have potential health benefits. In addition, most agreed that MUFAs and PUFAs have potential health benefits. However, while 98% of responding RDNs agreed that olive oil should be regularly utilized in food preparation, only 77% agreed that canola oil should be regularly utilized, even though they are both good sources of MUFAs. One explanation is that olive oil is often consumed in a less refined form.

As the 2015-2020 DGA state, fatty acids are needed for overall health and should not be avoided or isolated. The 2015-2020 DGA embody the idea that a healthy eating pattern is not a rigid prescription, but rather, an adaptable set of guidelines to help people enjoy foods that meet their personal, cultural, and traditional preferences and fit within their budget. The DGA 2015-2020 are based on the Social Ecological Model. Responding RDNs may have been considering this recommendation when justifying which fatty acids have potential health benefits. Moreover, some respondents may have been considering specific patient populations that may or may not have been at higher risk for disease at that time, and this may have influenced their responses.

Some discrepancies were noted among RDNs’ nutritional knowledge regarding good sources of n-3 fatty acids in fish. Low-fat seafood such as shrimp and tilapia are widely consumed. However, an average adult would need to consume approximately 104 oz of tilapia each week to meet weekly recommendations for n-3 fatty acid intake. Supplements rich in n-3 fatty acids such as fish oil may be needed especially by those who do not eat fish or other seafood—to ensure adequate intake of n-3 fatty acids, particularly the longer, more unsaturated n-3 fatty acids. Fish oil supplementation may decrease the risk of death from cardiac causes and from all causes, and it also may reduce the risk of sudden cardiac death. In a study by Dickenson et al., 47% of RDN respondents indicated they personally used fish oil or omega-3 supplements. Similarly, 63% respondents in the Fat Facts survey indicated they did not use the supplement. How often RDNs personally use a fish oil supplement was a significant predictor of fish oil recommendations in our study.

The 2010 DGA recommendations allowed for 20% to 35% of kcal to come from dietary fat. Individual factors such as knowledge and skill are essential for making consumption choices. If consumer eating patterns shift to include more of the recommended PUFAs, greater than 35% of kcal consumption may be needed if those shifts include “healthy” fats instead of processed carbohydrate.

Further research is needed to improve the understanding of RDN concerns and level of confidence regarding the tremendous variation and changing dietary fat guidelines. No studies were identified that have examined the relationship of nutritional knowledge, perceptions, and habits of RDNs regarding dietary fat recommendations.

Several limitations are associated with this research. As in any self-reported survey, individual factors such as mood, lack of time, social commitments, and lack of validity of questions as worded may have influenced how questions were answered, affecting the overall study results. Second, this study included personal questions such as dietary fat intake, which may not have been reported accurately or truthfully. A third limitation, lack of gender variation, existed in the sample with nearly 97% of the participants reported as female, but this is not dissimilar from CDR membership. Fourth, this study was performed nationally; therefore, regional variation in available foods (e.g., fresh fish) may have influenced the results.

A fifth limitation was that the electronic survey was first released in July; the response rate might have been higher during a month less frequently associated with vacations.

Conclusions

Overall, the current study revealed that perceived confidence levels vary among RDNs regarding specific dietary fat recommendations for SFA, MUFA, and PUFA. In addition, nutritional knowledge related to specific dietary fatty acids and food sources also varied among the RDNs surveyed. Lack of consensus among organizations developing dietary fat guidelines for consumers and providers have challenged not only the consumer but also the health professional to know which guidelines to follow. This study also showed that RDNs may have varying perceived confidence levels when making dietary fat recommendations. Clear and consistent science-based dietary fat recommendations may
not be currently provided by practic-
ing RDNs. RDNs need to use the most relevant recommendations for their practice depending on client health, risk of heart disease, or an otherwise individual need for a specific diet prescrip-
tion for fats.

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References


Influence of Hydration on Cognition and Skill Performance in Female Basketball Players

by Lindsay Howard, MS and Angela Hillman, PhD

Introduction

Although water composes the majority of the body’s cells, organs, and tissues, hydration recommendations are often omitted from nutrition prescription. It is well documented that physical performance of sport skills, cognition (short-term memory, reaction time), and metabolism are all adversely impacted by dehydration. However, the current body of research lacks sport-specific analysis of the effects of hydration on athletic performance and often generalizes recommendations for activities considered to be either anaerobic or aerobic, which is simplistic.

A reduction in body weight due to dehydration greater than 2% is commonly accepted as a threshold for declines in performance. Specifically, in an assessment of basketball, dehydration beyond a 2% loss of body mass is associated with decreased performance of basketball-related skills. Perceived exertion during basketball was decreased when participants were properly hydrated, suggesting that hydration could impact the mental aspect of athletic success. It is clear that dehydration affects multiple aspects of athletic performance; however, the recommendations for proper maintenance of hydration during a basketball game have not been clearly established.

In addition, much of the research surrounding the effects of hydration on exercise performance involves interventions of increased ambient temperature, voluntary dehydration, or both. This research generally indicates reductions in muscular strength and endurance, anaerobic power, and aerobic capacity after a loss greater than 2% of one’s body mass. However, there has been little analysis of dehydration during team sports that include both aerobic and anaerobic components, specifically in the sport of basketball, and little analysis of how this might affect athletic performance.

Much of the published hydration research has been conducted on recreational exercisers and athletes, although studies do not always involve team sports and are not always designed to replicate real-life game scenarios. More sport-specific research involving athletes is needed in order to apply the findings to that particular population. One understudied population is women basketball players. Therefore, the purpose of this study was to complete a realistic simulation of National Collegiate Athletic Association (NCAA) basketball play to obtain an accurate and thorough understanding of the effect of hydration status on various factors that contribute to the performance of a basketball player.

Methods

Participants

Eight female collegiate basketball players (age: 20 ± 2 y; height: 166.7 ± 4.1 cm; weight: 76.9 ± 10.7 kg) were recruited to participate in this study via email with an attached flyer. Inclusion criteria required that participants were current members of the women’s basketball team, between the ages of 18 and 22, and free of injury for the past 6 months. Participants were excluded if they had any cardiovascular, renal, or metabolic disorders, or had been diagnosed with phenylketonuria. All participants received informed written consent prior to engaging in any of the testing procedures. All procedures were approved by the Marywood University Institutional Review Board.

Testing Procedures

Participation consisted of one familiarization day as well as two testing days. On the familiarization day, each participant received an explanation of the protocol, provided a finger stick blood sample, and completed a bioelectrical impedance analysis for total body water and water distribution (BIA InBody 520; GE Healthcare, Madison, Wisconsin). Participants then completed two online cognitive assessments on HumanBenchMark.com to ensure acquaintance with the format and rules of the tests. The first test was a memory test in which they were presented with tiles that were highlighted and only seen for a few seconds. Once the tiles were hidden, participants clicked the tiles that were previously highlighted. They continued this process until they clicked incorrectly three times. The second test was a reaction time test where the screen starts as red and the participant is asked to click as soon as the screen turns green. They completed a total of five trials, which were averaged to give a final score. Participants proceeded into the gymnasium for full explanations and demonstrations of each of the on-court assessments including maximal vertical jump, a T-test, lay-up shooting, jump shooting, and a 300-yard shuttle run. Participants were given the opportunity to ask any questions about any of the testing protocols prior to leaving.

Two experimental trials separated by 2 days were completed by the participants. On testing days 1 and 2, participants were assigned to two experimental groups (which also served as their teams for simulated basketball competition). One group received a carbohydrate-electrolyte solution (CES) treatment (Gatorade G2, Gatorade, USA) providing 18 g carbohydrate, 411 mg sodium, and
114 mg potassium per 900 ml; the other group received a placebo beverage (sugar-free, calorie-free Crystal Light) providing 0 mg of sodium and 0 mg of potassium per liter. On both testing days, the participants arrived at the laboratory dressed for exercise and a finger stick blood sample was collected followed by BIA analysis. Each participant was assigned an Adidas Speed Cell foot pod (Adidas AG, Germany), and fastened it to the shoelaces of one of their shoes to assess the distance covered during the game simulation. The foot pod was synced to online MiCoach profiles (Adidas, USA) for wireless data collection.

Participants and researchers proceeded into the gymnasium to continue with testing. The participants were given 900 ml of fluid (half of the group received the placebo beverage and the remaining participants received CES in bottles labeled with their participant number). Additional CES and placebo beverage were provided to participants who consumed the entire contents of their bottles, and total volume consumed was recorded at the end of a basketball game simulation. Both teams completed a brief 5-minute warm-up and returned to their benches before the start of a 20-minute NCAA regulation first half of basketball. During these 20 minutes, two 60-second timeouts were called. At the conclusion of the first half, there was a 15-minute halftime period during which finger stick blood samples were collected. Participants were free to stay near their benches with access to their bottles for the duration of the on-court assessments.

The participants then proceeded to the first of the on-court assessments, the Vertec vertical jump protocol. Three trials were completed using a countermovement, and the highest jump height was used for analysis. Following this, the T-test was completed, which required participants to sprint and slide between a set of cones to assess agility. Participants then proceeded to the two basketball-specific assessments; the lay-up drill and the jump-shooting drill which were both adopted from previous research. Lastly, participants completed the 300-yard shuttle run, which consisted of running six full trips between a set of cones placed 50 yards apart. Immediately upon completion of the full test, participants provided their rating of perceived exertion (Borg RPE).

At the completion of these on-court assessments, participants returned to the laboratory and immediately provided a finger stick blood sample, which was assessed for blood lactate (Lactate Pro, NOVA Biomedical, USA) as well as hematocrit (Micro Hematocrit Reader, Hawksley, UK) and hemoglobin (Hemocue 201, Hemocue, Ltd, Sheffield, UK) in duplicate for calculation of plasma volume changes.

<table>
<thead>
<tr>
<th>Table 1. Mean Values for Measured Physiological and Performance Variables</th>
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<tr>
<td></td>
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<tr>
<td>Plasma volume change (%)</td>
</tr>
<tr>
<td>Total fluid intake (ml)</td>
</tr>
<tr>
<td>Blood lactate post-game (mmol/L)</td>
</tr>
<tr>
<td>Blood lactate post-drill (mmol/L)</td>
</tr>
<tr>
<td>Vertical jump height (inches)</td>
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<td>Jump shots made</td>
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<td>Layups made</td>
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<td>Reaction time (ms)</td>
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<td>Memory score</td>
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<td>Distance covered (km)</td>
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<td>Body mass change (%)</td>
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<td>Total body water change pre/post (%)</td>
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<td>Intracellular water change pre/post-test (%)</td>
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<td>Extracellular water change pre/post-test (%)</td>
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</table>

*Significant correlation between reaction time and volume of fluid consumed during placebo trial only (r = -0.71, P = .048).

**Significant correlation between memory score and plasma volume change during CES ingestion only (r = 0.90, P = .005).
Participants then completed a post-test BIA assessment, following the two online cognitive assessments.

Analysis of Data

All statistical analyses were conducted using IBM SPSS version 23. Pearson’s product-moment correlations were used to determine relationships between all variables between testing conditions. Analyses of plasma volume, blood lactate, and body water changes were completed using linear mixed models for repeated measures. A significance level of $P < .05$ was used for all analyses. Descriptive statistics are presented as mean ± standard deviation.

Results

All eight participants were included in all statistical analyses, and results are provided in Table 1. Plasma volume was decreased by $-1.3 ± 4.0\%$ versus $-3.2\% ± 5.0\%$ and body mass was reduced by $0.2 ± 0.1\ kg$ versus $0.4 ± 0.2\ kg$ in the CES versus placebo trials, respectively. These reductions were not significantly different between trials and corresponded with no significant difference in volumes of fluid consumed ($402 ± 344\ ml$ vs. $313 ± 214\ ml$ in CES vs. placebo). Likewise, the distances covered during the game ($1.78 ± 0.10\ km$ vs. $1.78 ± 0.22\ km$) were not different. There was a negative correlation between reaction time and total fluid (placebo) consumed ($r = -0.71, P = .048$). Similarly, lower plasma volume change resulted in higher scores on the memory test when consuming CES ($r = -0.90, P < .01$). Increased CES ingestion resulted in lower blood lactate concentrations both post-game and post-drill ($F = 19.83, P < .01$). There were no further statistically significant differences in outcome variables.

Discussion

Although participants in this particular study experienced only modest dehydration ($<2\%$ body mass reduction) during exercise, it is evident that consumption of a fluid regardless of macro- or micronutrient content was beneficial in maintaining fluid balance as indicated by no significant change in plasma volume or body mass (Table 1).

Lower plasma volume was concurrent with higher memory scores on the online memory test; however, this result was only significant when participants consumed CES ($r = -0.90, P = .005$). This finding suggests that fluid intake is important to cognitive performance, and also indicates carbohydrate may have had an impact on scores. Indeed, short-term memory$^{11}$ and attention$^{12}$ have been found to be enhanced after the consumption of fluids,$^{11}$ whereas overall vigilance is impaired with dehydration.$^{2}$

Indeed, short-term memory$^{11}$ and attention$^{12}$ have been found to be enhanced after the consumption of fluids,$^{11}$ whereas overall vigilance is impaired with dehydration.$^{2}$

The CES product used in this particular study contained 2 g of carbohydrate/100 ml (2% carbohydrate solution). A full bottle of CES provided 18.3 g of carbohydrate; however participants only consumed approximately half this volume ($400 ± 344\ ml$). It is currently recommended that athletes consume a sports beverage with a 6% to 8% carbohydrate concentration during exercise to maintain performance while simultaneously preventing any gastrointestinal distress.$^{13}$ Total time for the current study lasted longer than 1 hour, but not longer than 2 hours, indicating that consumption of beverages containing concentrations of carbohydrate less than 6% to 8% may still benefit a basketball player, which is in agreement with some recommendations,$^{2,13,14}$ but in opposition to others.$^{15}$

Body mass reductions are generally used as an indicator of degree of dehydration in research studies and in current hydration recommendations.$^{1,16}$ In these protocols, athletes are typically brought to a level of dehydration reaching a 2% to 4% reduction in body mass prior to testing. Brandenburg and Gaetz$^{17}$ found that despite large sweat losses only 4 of 12 female basketball players reached a body mass reduction of $<1\%$. This is consistent with our findings (Table 1) and others,$^{18}$ demonstrating that perhaps basketball players do not reach a level of $>2\%$ body mass reduction throughout a regulation basketball game, or at least throughout a first half, that would likely independently cause performance deficits.$^{16}$

In 2015, the NCAA instituted multiple rule changes in the game play of Division I, II, and III women’s basketball, including a switch to four 10-minute quarters as opposed to the traditional two 20-minute halves. With this rule change, players are given an extra 1-minute break at the end of the first and third quarters, giving them another opportunity to consume fluids. Body mass reductions were 2% maximally among participants in the current study, but perhaps when basketball players enter the last 25% of the game, body mass reductions would be higher and more detrimental effects could be seen. In future protocols, performance declines may be able to be detected during the last few minutes of...
the game rather than during the beginning of the second half; therefore, studies of longer game simulation are needed.

The statistical results of this study indicate that fluid intake, as well as type of fluid consumed (CES vs. placebo), have significant impact on cognitive performance (reaction time and memory). Given our limitations in sample size, assessments in a larger population need to be completed to rule out the possibility that dehydration might affect cognitive performance during game play.

In future studies, a research design that allows ad libitum fluid intake yet also controls for hydration status upon beginning the research protocol would be ideal. In the current study, measures were taken so that participants were unaware of the true purpose of the research, ensuring no conscious changes in hydration habits occurred. This caused variability in fluid consumption, which may have influenced the outcome. In addition, because basketball drills were performed in a controlled setting, participants were able to concentrate on each task independently. During actual game play, shooting, jumping, sprinting, and decision-making happen sporadically and simultaneously. Finally, in the current study, the eight participants came to each of the testing days well hydrated; however, it is unknown whether this is consistent among Division III women’s basketball players before actual games. It cannot be assumed that all share the same hydration habits prior to practices and games. With emphasis on sports nutrition for collegiate athletes, more attention and focus needs to be paid on hydration requirements, recommendations, and monitoring, which might include pre-game measurements of urinary specific gravity.

Lindsay Howard, MS is a full-time instructor in the Exercise Science department at Marywood University and is a Certified Strength and Conditioning Specialist with the National Strength and Conditioning Association. Angela Hillman, PhD is an assistant professor of Exercise Physiology at Ohio University.

References
The halfway mark in our fiscal year is upon us. As you read this issue of PULSE, the SCAN Executive Committee is initiating the planning process for the coming year, when I’ll pass the baton to the capable hands of Lindzi Torres. Truly, any volunteer’s elected or appointed time of service to SCAN is but one leg in a much longer race. My goal was, and remains, to faithfully shepherd SCAN’s strategic plan forward, according to the work of leaders who came before me, and in preparation for those to come.

Also at this time, the ballot for the coming year is being formed by our Nominating Committee. It is exciting to hear about the volunteers who have given their time and expertise in so many ways already, and who are now ready to take the next step to serve on the Executive Committee.

Beyond next year’s leaders, who are the leaders of the next 5, 10, or 20 years? Whether you are a new or experienced SCAN volunteer, I encourage you to think about what you want out of the experience. Are you enjoying the projects you are working on? Are you making new connections or exploring new skills? Have you given thought to how your volunteerism will translate into job opportunities or professional advancement? If you would like to build your leadership experience with SCAN, talk to one or more members of the SCAN Executive Committee about their own volunteer paths. I would welcome an email or call from you, to hear your thoughts and answer any questions you have about SCAN opportunities that may be a good fit for you.

Speaking of volunteers, I want to take a moment to thank each and every SCAN volunteer, staff, speaker, moderator, and sponsor for your incredible support of our presence at the 2017 Food & Nutrition Conference & Expo™ (FNCE®). Through your efforts we are able to complement the excellent FNCE® program with educational sessions specific to our practice areas. We are able to listen to and engage existing and new members. And we are able to meet face-to-face with each other, Academy staff, and our partners to build momentum for future efforts. Kudos and thanks!

One final thought: I write this letter with deep gratitude to my SCAN colleagues. I was sidelined with unexpected health issues just a couple of weeks before FNCE®. In the midst of the last-minute preparations, they all carried on while I took time to heal. Thanks to you all!


American College of Sports Medicine Annual Meeting
Denver, CO
May 30 – June 3, 2017

The 64th Annual Meeting of the American College of Sports Medicine was enjoyed by more than 6,000 exercise scientists, sport dietitians, sports medicine physicians, and other health professionals from across the globe. It is an excellent conference for sports dietitians who want to be on the cutting edge. Following are just a few highlights of some presentations that might be of interest to SCAN members:

- Does bone mineral density (BMD) in the legs differ in female athletes who participate in weightbearing versus non-weightbearing exercise, such as ice hockey versus synchronized swimming? Yes! Hockey players have higher BMD. To help optimize swimmers’ bone health, coaches and trainers should be encouraged to include training programs that focus on bone-loading exercises. Given that women’s BMD peaks between ages 16 to 20, this is particularly important for young swimmers.

- Could a carbohydrate mouth rinse be beneficial for Muslim sprint-athletes during Ramadan, when they do not eat during the daylight hours? Perhaps not. Active, healthy males (n=15) performed three trials of an intensive repeated sprint protocol (two sets of 5×5-second maximal sprints interspersed with 25-sec rest periods and 3-min recovery between sets). In each trial, they swished and spat out either 1) a carbohydrate-
containing pre-sprint mouth rinse; 2) a no-calorie placebo mouth rinse; or 3) they had no mouth rinse. The athletes’ performance was similar in all trials. Carbohydrate mouth rinsing seems to be more beneficial during endurance exercise than sprints.

A survey of 150 runners who completed a prospective running journal indicates that the participants experienced substantial gastrointestinal (GI) distress during 44% of their runs. While food may contribute to some of the problem, stress and anxiety (as occurs at races) plays a role as well. Perhaps runners need to practice stress management techniques—as well as pay attention to their food intake.

For athletes in weight-category sports (light-weight rowing, wrestling, etc.), water loading (consuming large volumes of fluid for several days, prior to withholding intake) is a means to increase body water losses following fluid restriction. To determine the effectiveness of this strategy, male combat sport athletes consumed for 3 days either 40 ml fluid/kg body weight/day (~3 L) for the control group or 100 ml/kg (~7.6 liters) for the experimental group. Both groups then restricted their intake to 15 ml/kg (~1.1 L) on the fourth day. The water-loaded group lost about 0.6% more body mass. Water loading did not create hyponatremia and appeared to be a safe and effective method to achieve short-term weight loss under the conditions utilized.

Muscle dysmorphia (MD) is a psychological disorder characterized by the self-perception that one is insufficiently muscular, despite often having large and strong muscles. MD often gets entangled with eating disorders. An online survey of 60 competitive bodybuilders suggests that their Eating Attitudes Test scores were low, on average, but their Body Dysmorphic Disorder Inventory scores were mid-range. The bodybuilders with high scores for MD were more likely to have eating disorder pathology, compared with the bodybuilders without MD. The most experienced competitive bodybuilders had the fewest symptoms of MD. This suggests (but needs to be confirmed by more research) that bodybuilders with MD may be attracted to the sport, but their symptoms may hinder long-term engagement in the sport.

Does nutrition knowledge translate into enhanced dietary practices that could improve performance? Generally not, according to most research studies. This held true for a team of Division 2 collegiate female cross-country runners (n=11). They completed nutrition questionnaires and 3-day food records before and after four 1-hour nutrition education sessions. While they gained knowledge, they reported not changing what they ate.

Do elite Ironman triathletes fuel differently from “average” Ironman participants during the event? Yes! A study compared the calorie, fluid, and caffeine intake of triathletes in the Hawaii Ironman World Championships to the intake of the less-elite participants in Ironman Wisconsin. In the championship event, the triathletes consumed more calories per hour (330 vs 240), fluid (3.8 L vs 3.3 L), and caffeine (110 mg vs 65 mg) while on the bike. These heftier fueling practices likely enhanced their ability to perform better (and may helped them get to the Championship event in the first place).

Hyponatremia (<135 mmol Na/L) is most commonly caused by over-hydration, but losses of sodium via sweat and lack of sodium intake during exercise can also play a role. In a 3-hour study in 93-degree F, 10 cyclists consumed a sports drink with either 480 mg or 1,380 mg sodium per liter in amounts that matched their sweat losses. With the low sodium trial, four cyclists experienced hyponatremia by the end of the ride, compared with only one cyclist who consumed the higher sodium beverage. Not everyone could complete the 3-hour test. Consuming more sodium than is in most sports drinks can be beneficial for athletes who exercise extensively in the heat.

Aspiring Navy SEALs have to complete SEAL Qualification Training. A survey of 264 of these serious “military athletes” indicates their diets ranked only 56 out of 100 on the Healthy Eating Index. This is slightly worse than the general U.S. population, with a score of 59. To the disadvantage of these trainees, their dietary patterns were low in health-protective fruits, vegetables, whole grains, and fish, but high in health-eroding refined foods with added sugar, fat, and alcohol. This type of eating pattern promotes inflammation and hinders optimal recovery from injuries.

Marines in training for acceptance into Special Operation Forces exercise extremely hard during their training program. One might think they would suffer from long-term undesired weight loss, but this is not the case. After each period of intentional severe food deprivation, the trainees managed to restore the significant amount of weight they lost. For example, in the toughest part of the 261-day training program (days 115-123), the men burned about 6,400 kcal per day. They had access to only 2,400 kcal of food—about 4,000 kcal/day less than they needed. They lost, on average, 11 lb (4.9 kg) yet intuitively returned to their baseline weights before their next intensive training mission.

Would taking a high dose of vitamin D, which has been shown to improve immune function, offer protection from upper respiratory tract infections (URTI$s) such as colds? To answer that question, Marines in basic training received daily for 12 weeks either 1,000 IUs of vitamin D or a placebo. The majority (72%) of recruits reported getting a URTI during the 12 weeks. The high dose of vitamin D did not offer a protective effect in this highly stressful environment. Perhaps they should be taught to reduce URTIs by having cleaner hands and getting adequate sleep?
Now that women get assigned to combat duty, the question arises: How well can the women perform physically compared with the men? To find the answer, 302 marines underwent comprehensive testing including strength, flexibility, balance, power, agility, and physical fitness tests (pull-ups, push-ups, sit-ups, bench press, 2-mile run, etc.). They then were stratified into three groups according to the test results, regardless of sex or body fat: Group 1: Best (all men), Group 2: Middle (mostly men), Group 3: Worst (mostly female). When compared by sex, the men, understandably, tended to have less body fat—except when compared with the best performing women. The amount of the male or female marines’ muscle-mass determined athletic performance more so than their body fatness. The best-performing men and women in Groups 1 and 2 had significantly more muscle than the men and women in Group 3. The researchers concluded that muscle mass may have a stronger association with performance during strength, aerobic, and anaerobic tests than does percent body fat. This is a good example of how the leanest athlete is not inherently the best athlete. For some athletes, adding muscle mass might be more important than losing body fat.

Summarized by Nancy Clark, MS, RD, CSSD, who has a private practice in the Boston area, where she counsels both fitness exercisers and competitive athletes, offers online workshops (www.NutritionSportsExerciseCEUs.com), and is author of the best-selling Nancy Clark’s Sports Nutrition Guidebook (www.nancyclarkrd.com).

Reviews

The Complete DASH Diet for Beginners
Jennifer Koslo, PhD, RDN, CSSD
Rockridge Press, 918 Parker St, Berkeley, CA 94710
866/744-2665
2017, softcover, 168 pp, $14.99

The DASH diet, also known as the Dietary Approaches to Stop Hypertension, is an eating plan that limits high-fat foods and focuses on promoting fruits, vegetables, whole grains, lean protein, beans, nuts, and low-fat foods. It helps lower blood pressure and aids in weight loss. High blood pressure can lead to a multitude of complications such as a heart attack, stroke, or heart failure. It is important for individuals to understand ways to lower blood pressure and how simple lifestyle changes can improve their overall health. The Complete DASH Diet for Beginners provides a simple and straightforward guide on how to successfully implement the DASH diet.

The book begins with an easy-to-read explanation of what the DASH diet is and its proven effectiveness. The guide is then separated into two parts. Part One goes through explanations of hypertension basics, guidelines for the DASH diet, steps on how to implement the DASH diet, meal plans, and how to get started. Part Two shifts gears by providing the reader with DASH diet recipes. Koslo shares recipes for breakfast and smoothies, vegetarian and vegan dishes, poultry and seafood, beef and pork, snack, sides, and desserts, broths, condiments, and sauces. The guide contains tables, graphs, and pictures to help the reader better understand how to accurately follow the instructions given.

In all, The Complete DASH Diet for Beginners is a simple, well-organized, and an easy-to-follow guide. It educates readers on background information regarding the benefits of the DASH diet, provides example meal plans to follow, and offers sample recipes to try at home. This book can be a beneficial tool for those who are looking to implement a healthier way of living through their diet.

Jennifer Koslo is a registered dietitian and a cardiovascular dietitian. She provides patients with nutritional assessments, education, and cardiac rehabilitation education. She is also the author of The Heart Healthy Cookbook for Two, Diabetic Cookbook for Two, Alkaline Diet for Beginners, and The Insulin Resistance Diet for PCOS. She also competes in marathons, triathlons, and other athletic events.

Reviewed by Kristina Morales, RD, clinical dietitian, Orange County, CA, and “Reviews” editor for PULSE.
Effect of Exercise Intensity on Post-Exercise Gastric Emptying


Previous studies have shown that gastric emptying decreases during higher intensity (>70% VO$_2$max) exercise. However, the effects of exercise intensity on gastric emptying post-exercise are unclear. Therefore, the purpose of this study was to determine whether exercise intensity influences the rate of gastric emptying following ingestion of a carbohydrate solution post-exercise. In this randomized, crossover study, five men and three women completed three experimental trials—rest, low-intensity exercise (33% VO$_2$max), and high-intensity exercise (1 min at peak power followed by 2 min of rest x 10)—on three separate occasions, each separated by 7 days. Thirty minutes after completion of the trials, participants drank 595 ml of 5% glucose solution. The rate of gastric emptying was measured for 60 minutes post-exercise with the double-sampling gastric aspiration method. Volume of the test solution in the stomach was significantly reduced in all groups after 10 minutes ($P<.05$). Total volume of the glucose solution emptied from the stomach after 1 hour did not vary significantly between trials ($P=.172$). In summary, the rate of gastric emptying and carbohydrate absorption post-exercise is not affected by exercise intensity. The results of this study support the notion that carbohydrates should be consumed soon after exercise for glycogen resynthesis regardless of exercise intensity.

Summarized by Kelsey Pearson, MS, RD, dietitian with Retrofit, Cottonwood Heights, UT.

Post-Exercise High-Fat Feeding and Muscle Protein Synthesis


Current sports nutrition recommendations include high-carbohydrate (CHO) consumption before, during, and after exercise training sessions. However, recent investigations suggest that CHO restriction may enhance adaptation to endurance training. Therefore, the purpose of this randomized, crossover design study was to compare the effects of a restricted-carbohydrate diet plus high-fat post-workout meal (HFAT: 2.5 g/kg CHO, 2.5 g/kg protein, and 3.5 g/kg fat) to an energy and protein matched high-carbohydrate diet (HCCHO: 10 g/kg CHO, 2.5 g/kg protein, and 0.8 g/kg fat) on key cell signaling and gene expression markers in 10 trained male runners. Following a standardized HCCHO breakfast, participants completed a twice-daily exercise session consisting of high-intensity training (HIT) (8 x 5 min running bouts at 85% VO$_2$peak) followed by steady-state running (SS) (60 min at 70% VO$_2$peak) 3.5 hours post-HIT. Participants consumed either HCCHO or HFAT snacks and meals 2 hours post-HIT and immediately, 2.5 hours, and 6.5 hours post-SS. Trials were separated by 7 days. Muscle protein synthesis (MPS) was significantly lower at 3 and 15 hours post-HFAT SS than post-HCHO SS ($P<.01$). P70S6K1, a marker of MPS, was significantly increased from pre-HIT for both diets 3 hours post-SS (30 minutes post-feeding).

The results of this study support the notion that carbohydrates should be consumed soon after exercise for glycogen resynthesis regardless of exercise intensity.”

Summarized by Angela Smith, graduate student, Coordinated Master’s Program Sport Nutrition Concentration, Department of Nutrition and Integrative Physiology, University of Utah, Salt Lake City, UT.
Whey Protein and Blood Pressure, Endothelial Function, and Lipid Biomarkers


“...dietitians may consider recommending whey protein supplementation to patients with high blood pressure.”

Cardiovascular disease (CVD) is a leading cause of death in many Western countries. A primary objective in reducing CVD risk is reducing blood pressure, a risk factor shown to be influenced by diet. Previous studies have linked reduced blood pressure (BP) with milk consumption. However, the exact compound in milk responsible for this reduction was previously unidentified. The purpose of this study was to test the effect of two specific bioactive compounds found within milk—whey protein and calcium caseinate—on vascular function and 24-hour ambulatory blood pressure (24-h AMPB). In this randomized, controlled, double-blinded three-way crossover study, 38 prehypertensive men and women were randomly assigned to ingest three isoenergetic supplements (2 x 28 g whey protein/day, 2 x 28 g calcium caseinate/day, or 2 x 27 g maltodextrin (control)/day) mixed with 250 ml water and noncaloric flavor concentrate for 8 weeks with a 4-week washout between interventions. Participants maintained an isocaloric diet during the study under the supervision of a dietitian. 24-h AMBP, flow-mediated dilation (FMD) (a marker of endothelial function), and lipid profile were measured pre- and post-intervention. Following whey-protein consumption, there was a significant reduction in 24-h systolic blood pressure (SBP) and diastolic blood pressure (DBP) (2.9 ± 1.1 mmHg and -2.0 ± 0.7 mmHg) compared with calcium caseinate (0.6 ± 1.7 and 0.3 ± 1.0 mmHg) and control (1.0 ± 1.1 and 0.5 ± 0.6 mmHg) (P ≤ .05). While both whey protein and calcium caseinate increased FMD (P < .001) and decreased total cholesterol (P < .05), whey protein also decreased triacylglycerol (P = .025) compared with control. Based on these results, dietitians may consider recommending whey protein supplementation to patients with high blood pressure. This study was supported by the Biotechnology and Biological Sciences Research Council (United Kingdom) with collaboration from Volac International Ltd.

Summarized by Claire Sorensen, graduate student, Department of Nutrition and Integrative Physiology, Coordinated Master’s Program, Nutrition, Education, and Research Concentration, University of Utah, Salt Lake City, UT.

Nitrate Oxide Consumed in the Diet May Improve Vascular Function

Velmurugan S, Ming Gan J, Rathod KS, et al. Dietary nitrate improves vascular function in patients with hypercholesterolemia: a randomized, double-blind, placebo-controlled study. Am J Clin Nutr. 2016;103:25-38. Vascular dysfunction is a significant contributor to cardiovascular disease and is related to decreased bioavailability of nitric oxide (NO). NO may improve vascular dysfunction through its vasodilator, antiplatelet, anti-inflammatory, and antiproliferative effects. This study examined the effect of dietary nitrate on vascular and platelet function in hypercholesterolemic patients. In this randomized, double-blind, placebo-controlled trial, 65 men and women aged 18 to 80 with total serum cholesterol >6 mmol/L, or elevated low-density lipoprotein (LDL) cholesterol or triglyceride levels (QRISK score >15%), consumed 250 mL of nitrate-rich beetroot juice or a nitrate-depleted control daily for 6 weeks. Flow-mediated dilation (FMD) of the brachial artery, aortic pulse wave analysis, a clinic blood pressure measurement, methemoglobin concentrations, and blood, urine and saliva were collected at baseline and at 6 weeks. Dietary nitrate treatment elevated circulating concentrations of both nitrate (~7.5-fold) and nitrite (~2.5-fold), which was associated with a 24% improvement in FMD response (P = .0003). Improvements were also observed in measures of arterial stiffness and vascular response. While the exact mechanisms are uncertain, improvement in NO activity may be related to reductions in inflammation-induced oxidative stress and NO scavenging that triggers systemic inflammation. These findings suggest that dietary nitrate may be useful in improving vascular and platelet functions in hypercholesterolemic patients and supports recommendations to increase fruit and vegetable consumption among this population.

Summarized by Christine Altamirano, graduate student, Department of Nutrition and Integrative Physiology, Coordinated Master’s Program, Nutrition Education and Research Concentration, University of Utah, Salt Lake City, UT.
Cast Your Vote for SCAN Leaders

Your vote counts! Take an active role in how SCAN is governed by participating in the upcoming election for SCAN leaders. Once again, SCAN will use an electronic ballot. To vote online, go to the home page of SCAN's website (www.scandpg.org) and click on the link that says “2018 Election Ballot.” Online voting polls open February 1, 2018; the final date to vote is February 15, 2018.

View SCAN's Latest Annual Report Online

Members can find SCAN's Annual Report for fiscal year 2016-2017 posted at www.scandpg.org/about-us/annual-reports/. To access the annual report, a member must be signed into the website, so the link will first prompt for credentials. The report provides an inside look at SCAN's programs, services, initiatives, and more—giving you important highlights on what SCAN has to offer, and how it is continually working for you.

Looking for Past PULSE Articles?

If you’re doing research or simply want to locate content that appeared in an archived issue of SCAN'S PULSE, check out the annual “Index of Topics” posted for each year on SCAN’s Website. You’ll find the issue and page number for each feature article (conveniently listed by practice area), and each item in the “Conference Highlights,” “Reviews,” and “Research Digest” departments. You can then instantly access the archived issue online. As a member benefit, all PULSE issues and annual indexes are available to you for free at www.scandpg.org/nutrition-info/pulse-newsletters.

Call for Abstractors for “Research Digest”

The “Research Digest,” which appears in each issue of SCAN'S PULSE, provides summaries of published papers relating to all of SCAN’s practice areas: nutrition for sports and physical activity, cardiovascular health, wellness, and disordered eating and eating disorders.

You can contribute to the “Research Digest” by volunteering to abstract a recently published study on any of the above practice areas. For details on this opportunity, contact Kary Woodruff, MS, RD, CSSD, co-editor of “Research Digest,” at kary.woodruff@health.utah.edu. Become a contributor to PULSE!

Of Further Interest

Christine Karpinski, PhD, RD, CSSD was named chair of the Department of Nutrition at West Chester University (WCU). In addition to her teaching responsibilities, she works with athletes at WCU and mentors undergraduate nutrition majors who are interested in sports nutrition. Chris served on the SCAN Executive Committee as the director of the Sports Dietetics-USA subunit from June 2013 through May 2016.

Kathryn Fink Martinez, MS, RDN, CEDRD recently had her article, “There’s Always Room for Ice Cream and Chocolate!” published in Obesity Surgery, a journal for bariatric/metabolic surgeons. Kathryn is a certified eating disorder registered dietitian and supervisor, a certified intuitive eating counselor, and a certified specialist in weight management. A past chair of the Nutrition Entrepreneur dietetic practice group, she currently serves on the board of directors of the International Federation of Eating Disorder Dietitians and is public relations director of the Behavioral Health Nutrition dietetic practice group.

Kristen Andrews, MS, RDN, CSSCs, previously the sports dietitian for the Los Angeles Galaxy of Major League Soccer and the U.S. Men’s National Soccer Team, was recently hired as the first full-time RDN to work for the Los Angeles Lakers. As the manager of nutrition and wellness, she oversees the club-wide nutrition support program with the goal of maximizing player performance, recovery, sleep, and overall wellness. This effort includes an emphasis on both individualized nutrition recommendations and education, with the aim of developing well-fueled and nutritionally literate players.

Liz Fusco, MS, RDN was highlighted on the Suncoast Network News for her work as the performance dietitian for the United States Rowing Association during the World Rowing Championships at Sarasota-Bradenton, FL from September 23-October 1, 2017. Liz is the wellness co-editor of SCAN’S PULSE.

If you have an accomplished that you would like to be considered for an upcoming issue of PULSE, please contact Traci Roberts at: fivespotjones@gmail.com
News from Wellness and Cardiovascular Nutrition (Wellness/CV) Subunit

Here’s an update on developments from the Wellness/CV subunit:

• Wellness Task Force Updates. The Wellness Task Force is developing a 3-year plan with the objective of creating materials and programming to best support SCAN members working in the wellness arena. Stay tuned for more details.

• Wellness/CV at the 2018 SCAN Symposium. It’s no secret that time in the great outdoors can be beneficial to our overall health and wellness. So what better location than the Rocky Mountains to advance our knowledge and network with SCAN colleagues? Join us at the 2018 SCAN Symposium (see box on page 27) in May at the Keystone Resort. Some Wellness/CV-focused sessions will include: “Nutrition Guidelines for Treating Patients with Familial Chylomicronemia Syndrome”; “The Benefits of a Wellness Program on the Long-term Health and Performance of Fire Fighters”; and “The Art and Science of the Non-Diet Approach.”

• Resources. Looking for trusted resources to use in your wellness- and/or cardiovascular-focused practice? Visit SCAN’s website to download the latest fact sheets and find links to evidence-based position stands and partner organization sites. You’ll find these at www.scandpg.org/cardiovascular. All of the Wellness/CV fact sheets were updated in the past several months. If you have one you’ve been using for a while, check the SCAN website to download the most up-to-date version. You can also find new webinars on the SCAN website in the e-library. Remember, webinars are free to members for the first month.

• Volunteers Needed. SCAN is currently seeking a member with experience and interest in championing reimbursement for dietitian services. Contact Amanda Clark at amandaclarkrd@gmail.com if you’re interested in this position.

News from DEED Subunit

Following are announcements from the Disordered Eating & Eating Disorders (DEED) subunit:

• Professional Development. DEED continues to provide our members with eating disorder education. As such, we are working on another series of four fact sheets and a new webinar for this year. If you need ED references now, check out the SCAN website at www.scandpg.org/e-library/ to see the most current fact sheets available.

• Let’s Hear from You! We are always looking for new ideas for educational materials to produce. To share your thoughts and ideas, contact the DEED Director, Sarah Gleason, RDN, CEDRD, at sarah@sarahthedietitian.com.

News from Sports Dietetics—USA (SD-USA) Subunit

Below are some highlights from the SD-USA subunit:

• Expanding the Arena Initiative: Optimizing Performance on Every Stage. Through this new initiative, SCAN will be working to promote untapped opportunities to our members and other professionals. In the sports arena, we know that the traditional view of the sports RDN working strictly with athletes in organized sports does not reflect our diverse work settings and client populations—in reality, sports RDNs may work with first responders, military personnel, adventure racers, musicians, and more! Be on the lookout for new resources from this initiative as well as professional development opportunities and inspirational member profiles. Also, consider volunteering to be involved in this initiative or on other SCAN projects. Sign up at www.scandpg.org/volunteer-opportunities/ and indicate your area of interest.

• SCAN Speaking Opportunity. The SCAN-NATA Committee has developed a PowerPoint presentation that highlights the collaborative working relationship of sports RDNs and ATCs. Any SCAN member can apply to offer this presentation at a NATA-approved provider program. SCAN benefits from increased exposure, NATA members benefit by connecting with a local nutrition expert, and you can benefit from potential referrals and an honorarium. Contact Jennifer Doane at jdoane@anwnutrition.com for more information.

• External Relations. Did you know that SCAN also has official partnerships with the National Athletic Trainers’ Association (NATA), the National Strength and Conditioning Association (NSCA), and Professionals in Nutrition for Exercise and Sport (PINES)? If you are interested in growing these relationships, please contact the SCAN Office at info@scandpg.org.

• New Webinars. Check out our two newest webinars: What Should Dietitians, Coaches, and Athletes Know About Glycogen Metabolism and Dietary Interventions for Athletes with GERD. These webinars are available at www.scandpg.org/store/default.aspx?search=Webinars. As always, they are free with your SCAN membership!

Manuscripts for PULSE Welcome

SCAN’s PULSE welcomes the submission of manuscripts to be considered for publication. In particular, PULSE is interested in receiving original research reports and review articles. Manuscripts presenting practical guidelines, case studies, and other information relative to SCAN will also be considered.

Manuscripts must be prepared and submitted in accordance with PULSE’s Guidelines for Authors; only manuscripts that follow these guidelines will be considered. The Guidelines for Authors can be accessed at www.scandpg.org/nutrition-info/pulse/.

Step Up Your Sports and Fitness Nutrition Game

Sports dietitians are welcoming the latest version of the renowned sports manual, Sports Nutrition: A Handbook for Professionals, sixth edition. This
long-standing, authoritative reference covers timely research and evidence-based advice for health professionals working with athletes at all levels. Written and reviewed by esteemed sports RDs and other exercise experts, this comprehensive manual incorporates theoretical and practical information with key takeaways designed for easy implementation in daily practice.

Now in full color, the latest Sports Nutrition explores all areas of sports and fitness nutrition for both the seasoned and novice dietitian. Included in this edition is a new chapter discussing emerging opportunities in sports nutrition, a completely revised overview of exercise physiology, strategies for sports nutrition assessment, updated population- and sport-specific recommendations, and more. It also serves as an excellent text for sports nutrition courses and a study aid for the CSSD specialty exam. The price is $65 for Academy members. To order, go to www.eatright.org. Desk copies for educators are available at www.surveymonkey.com/r/KGQ2XRF.

Academy Offers Book on Eating Right and Exercising After 50

It’s never too late to make healthful improvements, as demonstrated in a new resource from the Academy: Food & Fitness After 50: Eat Well, Move Well, Be Well. This useful book translates the latest science on aging, nutrition, and exercise into simple, actionable steps. Packed with real-life stories, practical advice, and successful tips, Food & Fitness After 50 helps readers create a personalized road map for getting healthy and staying healthy.

The coauthors, one of whom is a SCAN member, share years of nutrition and exercise knowledge to offer a common-sense approach that helps readers control their food choices and fitness strategies while navigating their 50s, 60s, 70s, and beyond. The goal is to learn to embrace aging, accept the challenges, and gain the confidence to eat well, move well, and be well. The book sells for $17.99 at www.eatrightstore.com.

Strategies for Opening—and Growing—Your Practice

Now available from the Academy is the second edition of Making Nutrition Your Business: Building a Successful Private Practice. This insightful resource provides detailed advice on marketing and growing your business, billing and reimbursement, getting clients to return, and much more. Written by two experienced and successful private practitioners, this edition also includes a new chapter of success stories from private practitioners and a comprehensive resources section. Making Nutrition Your Business is a must-read for all dietetics professionals who aspire to go out on their own. The price is $49.99 for Academy members. The book is available at www.eatrightstore.org.

Link Between Worksite Wellness and Chronic Disease Prevention

According to the Bureau of Labor Statistics of 2016, Americans spent 41% of every food dollar on food purchased away from home. The Academy encourages the Centers for Disease Control and Prevention (CDC) to recognize worksite food consumption for its expected substantial contribution to overall nutrition and calorie intake and thus its effect on health status, including prevention of cancer, cardiovascular disease, and other chronic diseases. In October 2017, the Academy released comments on the CDC’s Draft National Occupational Research Agenda for Cancer, Reproductive, Cardiovascular and Other Chronic Disease Prevention, which focuses on the preventive nature of effective workplace wellness measures. In these comments, the Academy emphasized its support for the continuation of funding, research vetting of relevant resources, and the sharing of best practices and strategies from successful evidence-based workplace wellness programs.

FDA’s Proposed Delay of Nutrition Facts Label Compliance

The Academy is in the process of reviewing the rationale from the Food and Drug Administration for its proposed delay of the compliance deadline by up to 1.5 years for final rules associated with the updated Nutrition Facts Label. As stated by the FDA in its proposal, manufacturers with $10 million or more in annual food sales would have until January 1, 2020 to implement the new label, and manufacturers with less than $10 million in annual food sales would have until January 1, 2021. The Academy plans to comment to the FDA regarding its proposal and its consistency with the Academy’s Principles for Nutrition Labeling.
Upcoming Events

April 5-8, 2018
ACSM’s Health & Fitness Summit & Exposition, San Diego, CA. For information: acsmsummit.org

April 21-25, 2018

May 4-6, 2018

May 30-June 3, 2018
ACSM Annual Meeting, World Congress on Exercise is Medicine®, and World Congress on the Basic Sciences of Exercise and the Brain, Denver, CO. For information: www.acsmannualmeeting.org

June 9-12, 2018
The American Society for Nutrition will host its annual meeting (Nutrition 2018) separately from Experimental Biology for the first time this year in Boston, MA. For information: https://meeting.nutrition.org/