

SCAN'S

Pulse

Winter 2016, Vol. 35, No. 1

■ CONTENTS

- 1
Soy for Healthy Living and
Active People
- 3
From the Editor
- 6
CPE article:
Tart Cherries: The "Bittersweet"
Evidence in Exercise Recovery
- 10
Discovering the Role of Yoga in
Eating Disorder Treatment
- 13
Efficacy of Nutrition Education
Within a Cardiac Rehabilitation
Program in Eliciting Heart Healthy
Diet Changes
- 18
From the Chair
- 18
Conference Highlights
- 20
Reviews
- 20
Research Digest
- 22
SCAN Notables
- 23
Of Further Interest
- 24
Upcoming Events

Soy for Healthy Living and Active People

by Christine Rosenbloom, PhD, RDN, CSSD, FAND; Sarah Romotsky, RDN; and Alyssa Tindall, RDN

Half of Americans report putting a lot of thought into the healthfulness of foods and beverages,¹ yet there is a lack of knowledge on the benefits of soy. The 2014 International Food Information Council (IFIC) Foundation Food & Health Survey, an online survey of 1,005 Americans, revealed that more than 90% of respondents recognize the benefits of protein for health and wellness.² While 1 in 4 Americans choose soy as a protein source as part of their regular diet, only one third recognize the role of soy in promoting heart health.¹ These consumer insights reveal a potential gap in understanding the variety of benefits soy and soy protein can confer. This article provides registered dietitian nutritionists (RDNs) with evidence-based guidance on how to help active clients understand the value of soy as well as dispels common myths about soy.

Benefits of Soy for Healthy Active Living

Soy can be consumed as soybeans or in more concentrated forms such as soy meat analogs, beverages, or bars. Soy is a nutrient-dense source of high-quality protein, vitamins, and minerals. Whole soybeans contain

about 40% protein and soy protein concentrates or isolates contain 65% to 90% protein.³ Table 1 (p. 4) shows serving sizes of soy foods and grams of protein per serving. There are a variety of ways soy can be incorporated into the daily diet of active individuals (see Table 2, p. 5).

Soy and Muscle Protein Synthesis

Active people, from athletes to aging adults, desire to maintain or gain lean mass. Muscle produces power and strength to support activity, thus improving muscle protein synthesis (MPS) is a worthy goal at any age. It is important to note, however, that lean mass accretion is also influenced by the rate of muscle protein breakdown, which should be considered when interpreting changes in MPS. Most active people are likely already aware of the benefits of consuming protein for MPS. The research literature suggests that the branched chain amino acid, leucine, is one of the key amino acids that stimulates MPS.⁴ Soy protein contains leucine and is effective at promoting MPS; however, one study has suggested that it may not be quite as effective as whey but more so than casein at 3

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hours post-consumption.⁵ However, the timing of when MPS is measured (early or later following consumption) can impact results of studies in this field of research. Digestion rates vary across protein sources, which has led to publications that indicate that soy may not be quite as effective as whey but more so than casein.⁵ Although it varies by brand, approximately two scoops (40 g) of soy protein powder provides almost 3 g of leucine, an amount demonstrated to stimulate MPS.⁴

Soy protein has also been shown to support lean mass accretion more effectively than a carbohydrate-only snack and similarly to whey protein.⁶ In one study, researchers gave 26 untrained healthy men and women supplemental whey protein, soy protein (1.2 g/kg body mass plus 0.3 g/g sucrose) or placebo (carbohydrate only). Protein supplementation used during resistance training, regardless of the source, increased lean mass and strength when compared with an isocaloric placebo.⁶

In a double-blind randomized trial, Reidy and colleagues⁷ sought to determine whether a protein blend of soy and dairy was advantageous relative to each protein alone. Subjects performed resistance leg exercise at high-intensity, and were given whey protein (WP; ~18 g whey protein) or a soy-dairy blend (PB; 19 g protein) post-exercise. Both beverages contained enough essential amino acids (8.6 g) to maximally stimulate fractional synthetic rate (FSR), a measure of dietary protein assimilation into muscle protein, and were similarly effective, but the soy-dairy blend prolonged FSR later into the recovery period compared with the whey beverage.

Special Concerns of Vegetarian Athletes

Protein recommendations for vegetarian athletes do not differ from those of omnivores, as long as they are meeting their daily essential amino acid needs through consumption of complete proteins over the

course of the day. A variety of protein sources can be used to meet needs to support muscle recovery after exercise by supplying adequate amino acids to muscle to fuel repair. Soy protein is well digested⁸ and is an excellent option for vegetarian athletes because it is a complete protein (i.e., it contains an adequate proportion of all the essential amino acids). Including soy protein after training provides skeletal muscle with amino acids for repair and increased MPS relative to training alone; however, as previously noted, soy protein alone may not be quite as effective as a blend that takes advantage of differing digestion rates when combined with dairy protein.⁷ Soy foods are also typically high in calcium and zinc and are often fortified with vitamins D and B₁₂, which may be lacking in a vegetarian athlete's diet.

Soy Protein and Satiety

Protein is known for its satiating properties.⁹ The protein leverage hypothesis⁹ predicts that an inverse relationship exists between protein intake and total energy intake. Complete proteins such as soy appear to be involved in hunger suppression through several proposed mechanisms, including recognition of essential amino acid intake by the hypothalamus and changes in gastrointestinal food regulation hormones.¹⁰ Furthermore, increasing soy intake may aid in weight management, maintenance of lean body mass, and reducing heart disease risk.^{10,11}

Soy and Heart Disease Risk Reduction

In 1999, the Food and Drug Administration approved the following health claim for soy: "25 grams of soy protein per day, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease." RDNs often focus on prevention and lifestyle modification for their active clients, and helping them to incorporate soy may be a positive step. Numerous meta-analyses published recently have confirmed the chole-

From The Editor

What's Your Angle?

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

As you can see from reading through the table of contents, we've covered the field of nutrition from many angles in this issue of *PULSE*. Regardless of whether your professional expertise lies in just one or two of our four signature areas (sports nutrition, cardiovascular health, wellness, or disordered eating and eating disorders), I think you'll consider all of the articles presented in these pages to be of interest.

On the cover you'll find an article contributed by Christine Rosenbloom, PhD, RDN, CSSD, Sarah Romotsky, RDN, and Alyssa Tindall, RDN, on the role of soy in promoting wellness in active individuals. Our free CPE article by Karen Keane, MRes, and Glyn Howatson, PhD, describes the potential impacts of tart cherries on several possible components of exercise recovery including muscle repair, sleep promotion, and reduction of infection risk. Lisa Diers, RD, who is also an experienced registered yoga teacher, lends her perspective and summarizes research regarding the use of yoga as an adjunct for treating eating disorders. You also won't want to miss the original research article by Heather Butscher, MS, RDN, Keisha Angell, MS, RDN, and Richard Josephson, MD, MS, on the role of nutrition education provided by RDNs on dietary changes among enrollees in a cardiac rehabilitation program.

As always, we've also included plenty of other information for you in our regular departments, so be sure to check out all the other angles. And if, while you're reading this issue, you find that you'd like to angle for different topics in upcoming issues, feel free to contact one of our editors with your suggestions.

terol-lowering benefits of soy protein.¹² In a recent review of lifestyle interventions to manage hypercholesterolemia, Mannu and colleagues reviewed research published in the past 14 years and concluded that soy was an important food to include in a healthful diet to lower cholesterol levels and reduce risk of heart disease.¹³

In a recent clinical trial, researchers found that a moderately high-protein diet including 30 g soy protein may decrease risk factors for metabolic syndrome, thereby potentially reducing risk of heart disease.¹¹ Using a randomized crossover design, 15 postmenopausal women were assigned to "soy-protein" or "mixed animal protein" diets, which were designed to have equal amounts of protein (22% of energy), and to be weight-maintaining, so that weight loss was not a factor in altering metabolic end points. Compared with the animal protein diet, the soy protein diet resulted in significantly improved insulin sensitivity and lower total and low-density lipoprotein cholesterol (4% and 9%, respectively). Replacing 30 g of animal protein with

soy protein represents a practical, relevant strategy for improving risk factors for metabolic syndrome.

Barriers to Consumption

RDNs may have more success getting individuals to consume soy if the focus is less on the nutrients and more on overcoming the barriers to using soy. In a novel study of young women (n=502, aged 20-35 y), Wansink and colleagues¹⁴ found that 44% of the variance in whether tofu was consumed or not was related to the belief that it does not taste good, is hard to prepare, is too expensive, and that only a "good" cook can prepare tofu. Only 12% of respondents chose to consume tofu due to its nutritional benefits. The 2013 IFIC Functional Foods Survey¹ revealed that the biggest perceived barrier to consuming health promoting foods is cost; many consumers believe that healthful foods are more expensive. Focusing on quick meal preparations that are easy to prepare, affordable, and convenient can help individuals consume more healthful foods.¹⁴ There are many soy products that can readily be incorporated into meals,

including flavored soymilk, soy-based meat alternatives, soy nuts and nut butter, soy yogurt, soy cereal, and soy baked goods such as waffles and bread. The inclusion of soy at any meal/snack time needn't be any more difficult than preparing and serving standard fare, given the variety, quality, and convenience of soy foods widely available.

Soy Myth-Busting

Myth #1: Should men avoid soy?

This controversy is driven by the presence of isoflavones (also known as phytoestrogens), which are found in many plant sources including soy, nuts, and legumes. Isoflavones are often referred to as phytoestrogens because they are similar in structure to estradiol, a form of estrogen,¹⁵ but isoflavones cannot be equated to estrogen. Although there are common characteristics, the effects of isoflavones in the body are not equal to those of estrogen. The small differences in structure can greatly affect the activity of a compound in the body.

Table 1. What Constitutes One Serving of Soy?

Soy Food	Serving Size	Grams of Protein
Edamame	½ c	14
Miso	½ c	16
Tempeh	½ c	16
Textured soy protein	½ c	11
Tofu, silken soft	1 slice (84 g)	4
Tofu, silken firm	1 slice (84 g)	5.8
Tofu, silken, extra-firm	1 slice (84 g)	6.2
Tofu, lite firm	1 slice (84 g)	5.3
Tofu, lite extra firm	1 slice (84 g)	5.9
Soy shake	8 oz	10
Soy pudding	8 oz	2-3
Soy cheese	1 slice	2-4
Soy butter	2 T	7
Soy chips	1 bag	7
Soy energy bar	1 bar	6-14
Soy milk	1 c	8
Soy nuts	¼ c	8
Soy yogurt	1 c	9
Soy burger	1 patty	14
Soy sausage patties	1 patty	10
Soy sausage links	2 links	9
Soy dogs	1 dog	7
Soy meatballs	5 meatballs	15

Sources: Agricultural Research Service; USDA; National Nutrient Database for Standard Reference, Release 26; and product information from manufacturers' Web sites

iron present in soybeans is poorly absorbed. While soy is an iron-containing food, many believe that the phytate content of soy reduces iron availability. However, ferritin, the form of iron in soybeans, is absorbed well.¹⁸ In a 10-week randomized control trial, researchers gave premenopausal women two to three servings of soy foods or non-soy foods, matching foods for type (i.e., soy milk for cow's milk, soy burger for beef burger, etc.).¹⁹ At the end of the trial, there were no significant differences in serum hemoglobin, iron, or transferrin saturation, suggesting the iron in soy was adequately bioavailable to prevent a reduction in iron status over the relatively short duration of the study. This research suggests that the notion that soy foods reduces iron status is a misperception. This is an important consideration for active women and vegetarian athletes who often struggle to consume adequate iron in their diets.

Myth #3: Should soy be avoided in individuals with breast cancer?

Another misperception regarding soy protein involves individuals with breast cancer as well as those in remission. A recent review of the existing literature by the American Institute for Cancer Research states that consuming three servings of soy foods a day is not associated with increased cancer risk.²⁰ In addition, the American Cancer Society concluded that breast cancer patients can safely consume up to three servings of traditional soy foods per day, although the group advised against the use of more concentrated sources of isoflavones such as powders and supplements.²¹

Numerous human studies have shown no negative side effects of consuming soy foods.²² Kahn and colleagues analyzed breast tissue biopsies before and after soy isoflavone exposure for 6 months at a dose that approximates the upper quartile of intake of soy-consuming Far East Asians and found no indication of cancer cell proliferation.²³ The study,

Well-designed human studies show that isoflavone exposure does not lower testosterone levels.¹⁶ One study has recently shown slight changes in testosterone (but not estradiol) immediately after exercise in young men who have above-average testosterone, with no differences observed between dietary treatment groups an hour after consumption nor after 14 days of consumption.¹⁷ A recent meta-analysis was conducted to determine whether the consumption of

soy protein has an effect on hormone levels. The study concluded that neither isoflavone-rich protein nor isoflavone supplements affect circulating levels of total testosterone, sex hormone-binding globulin, free testosterone, or the free androgen index.¹⁶

Myth #2: Is the iron in soy absorbed?

Another myth about soy is that the

conducted with pre- and post-menopausal women, found there was no evidence of cell proliferation or increased breast density in either group. Overall, consumption of soy foods has not proved to be dangerous for breast cancer patients; they can experience and utilize the benefits of soy as part of a healthful, active lifestyle.

Conclusion

Active individuals can be encouraged to enjoy soy foods as part of a performance-enhancing diet in addition to promoting optimal health. The majority of Americans are aware of and interested in learning more about health-promoting foods such as soy,¹ and RDNs are well positioned to help translate the science and communicate the benefits of soy food consumption.

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Table 2. Top Ten Soy Meal and Snack Ideas for Active Individuals

- Tofu noodle bowl (good choice at Asian quick-service restaurant)
- Frozen edamame with a soy sauce dip (good snack for salty sweaters)
- Soy milk and whole grain cereal (good snack for vegetarian athlete)
- Whole soy energy bars (for pre-workout fuel or post-workout recovery)
- Isolated soy protein used in shakes (good for meal replacement or post-workout recovery)
- Isolated soy protein smoothies (good for lactose-intolerant active individuals)
- Soy yogurt (good for snacks)
- Soy nuts (good for multi-event sports days as between heat snack)
- Soy burger (good meal for vegetarian or weight-conscious athletes)
- Soy pudding, soy cheese slices, or flavored soy milk (good for snacks)

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CPE article

Tart Cherries: The “Bittersweet” Evidence in Exercise Recovery

by Karen M. Keane, MRes, and Glyn Howatson, 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/nutrition-info/pulse-newsletters/). 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:

- Summarize the evidence in the literature regarding the effects of tart cherries on muscle damage.
- Discuss research findings relevant to the effects of tart cherries on the quality and duration of sleep.
- Provide recommendations to athletes regarding the consumption of tart cherries to improve exercise recovery and positively modulate sleep.

Research examining supplementation with functional foods for health and in exercise has gained momentum in recent years, with beetroot juice, purple sweet potatoes, blueberries, pomegranate juice, green tea, and tart cherries receiving attention regarding their purported applications. Cherries, which have provided several avenues for research because they contain high levels of bioactive compounds, have been compared favorably with other functional foods. Among the 20 most commonly consumed fruits, cherries are suggested to have the fifth highest total phenolic content.¹ Data support the presence of several phytonutrients in Montmorency tart cherries including the flavonoids isorhamnetin, kaempferol, quercetin, catechin, epicatechin, procyanidins, and anthocyanins.² Tart cherries are one of the richest sources of anthocyanins, which give them their rich red color, and they also appear to have the greatest antioxidant capacity.³ Mechanistically, it is thought the phenolic compounds within tart cherries act as “reactive oxygen

species” scavengers that reduce oxidative stress.⁴ In addition, the anti-inflammatory properties⁵ of tart cherries largely attributable to the high anthocyanin content have been reported to be at a level comparable to several nonsteroidal anti-inflammatory drugs.⁶

A growing body of scientific evidence is consistently linking tart cherries to an array of important health benefits, as highlighted in a recent review.⁷ Of particular interest is the increasing number of peer-reviewed studies that have examined novel applications of tart cherries relevant to exercise recovery and managing exercise-induced inflammation, managing oxidative stress, and positively modulating sleep. This work has not gone unnoticed, and tart cherries are routinely used by elite athletic populations in professional soccer, professional and international rugby union, professional road cycling, the National Hockey League, and others. These study findings has had an impact on sales and the public interest on tart cherries as a functional food.

This article provides a review of the potential use of tart cherries in exercise recovery.

Muscle Damage

Disruption of the structures in exercising muscle leads to a cascade of events resulting in impaired muscular function.⁸ Eccentric muscle actions are accepted as the source of mechanical stress that causes primary muscle damage and the subsequent secondary inflammatory cascade and impaired muscle function.⁹ Connolly and colleagues¹⁰ were the first to investigate the application of cherry juice supplementation in a damaging exercise model. Using a double-blind, placebo-controlled, crossover design, they examined the effects of 12 fluid oz of a cherry juice blend (fresh pressed tart cherries and apple juice), twice daily for 8 days on isometric elbow flexion strength, pain, and muscle tenderness following a bout of eccentric elbow flexion contractions (2 × 20 max contractions). The results showed that strength loss and pain were significantly less in the cherry juice trial versus placebo. Most notably, strength loss averaged over the 4 days after eccentric exercise was 22% with the placebo but only 4% with the cherry juice. Although the investigators did not record measures of inflammation or oxidative stress, they speculated that

the differences were due to the anti-inflammatory and antioxidant properties of the cherry juice.

Consequently, Howatson and colleagues¹¹ examined measures of inflammation and oxidative stress to help elucidate the potential mechanisms of cherry juice supplementation. In comparison to placebo, Montmorency tart cherry juice taken 5 days before, the day of, and 2 days after running a marathon was effective at accelerating recovery of strength, increasing total antioxidant capacity, and reducing lipid peroxidation (lipid oxidative stress index), interleukin-6 (IL-6), high-sensitivity C-reactive protein (hsCRP), and uric acid (inflammation indices). This represents a broad spectrum of activity in aiding recovery and providing protection against the exercise-induced inflammation and oxidative stress associated with prolonged running.

In a more recent addition to the literature, Bell and colleagues¹² examined the impact of a tart Montmorency cherry concentrate on physiologic indices of oxidative stress, inflammation, and muscle damage across 3 days of simulated road cycle racing. They reported that lipid hydroperoxides, IL-6, and hsCRP responses to trials were lower in the cherry group versus placebo. The attenuated oxidative and inflammatory

responses suggest that tart cherries may be efficacious in combating post-exercise oxidative and inflammatory cascades that can contribute to cellular disruption. In addition, they demonstrated direct application for tart cherries in repeated days cycling and conceivably other sporting scenarios in which back-to-back performances are required. Since 2010, there have been several other studies¹³⁻¹⁶ using different forms of exercise stress that have demonstrated similar positive results when examining the relationship between tart cherries and recovery. Table 1 provides a summary of human studies, including the aforementioned; interestingly, all of these studies show positive effect on one or more aspect of exercise recovery.

What athletes can do: Drink a 10-oz glass of tart cherry juice before workouts. Most of the exercise recovery studies have provided participants with two 8-oz or 12-oz bottles of tart cherry juice per day. Previous studies have suggested that a loading phase of 3 to 16 days is effective when recovering from metabolic and mechanical stress.

Sleep

An often forgotten element of the recovery process is sleep. Insomnia, defined as trouble sleeping on average

Table 1: Summary of Human Studies Examining the Effect of Tart Cherries on Exercise Recovery

Study	Metabolic/ Damage (Met/Dam)	Function	Soreness	O ₂ Stress	Inflammation
Connolly et al (2006)	Dam	Yes	Yes	-	-
Kuehl et al (2010)	Met/Dam	-	Yes	-	-
Howatson et al (2010)	Met/Dam	Yes	No	Yes	Yes
Bowtell et al (2011)	Dam	Yes	No	Yes	No
Kastello et al (2014)	Dam	Yes	Yes	No	Yes
Bell et al (2014)	Met	-	No	Yes	Yes
Bell et al (2015)	Met	Yes	No	No	Yes
Total		5/5 (100%)	3/7 (43%)	3/5 (60%)	4/5 (80%)

more than three nights per week, can be an annoyance for some, but long-lasting sleeplessness can seriously affect health, especially in the elderly. Insomnia is linked to a higher prevalence of chronic pain, high blood pressure, and type 2 diabetes, and a decline of cognitive function or an increase in dementia.¹⁷ An estimated 50 to 70 million adults in the United States have a sleep or wakefulness disorder, with more than one quarter of the population reporting they do not get enough sleep.¹⁸ Athletes and indeed members of the wider populations can suffer from disturbed sleep due to travelling across time zones, high training loads, shift work, over-reaching, and unexplained underperformance syndrome or some other underlying pathology such as insomnia. Interestingly, in addition to the aforementioned phenolic compounds, tart cherries contain relatively high concentrations of melatonin.¹⁹ Melatonin has a strong influence on the sleep-wake cycle in humans and is associated with sleep-promoting properties.²⁰ Moreover, a strong positive relationship between increased melatonin and total sleep time in healthy, young individuals has been previously demonstrated.²¹

Previous research has indicated that tart Montmorency cherries might help improve the quality and duration of sleep, reduce the severity of insomnia, and increase overall sleep efficiency. In a small-scale pilot study by Pigeon and colleagues,²² the efficacy of tart cherry juice consumption on sleep indices in a population with late-life insomnia was examined. The investigators reported that sleep was improved when two 8-oz servings of tart cherry juice was consumed every day for 2 weeks in older adults with moderate insomnia. Specifically, there were modest improvements in subjective quality of sleep, including improvements in insomnia severity index (8%) and sleep efficiency (5%). In addition, total sleep time increased by 8%, equating to 90 minutes over a two-week period among older adults with insomnia. However, no objective measures of sleep such as actigraphy were taken, and the potential mecha-

nisms responsible for the reported sleep improvements (e.g., melatonin) were impossible to discern. The authors speculated that increased dietary melatonin associated with consumption of tart cherry juice might be responsible for the changes. An alternative hypothesis asserts that the anti-inflammatory properties of tart cherries may have some influence on the pro-inflammatory cytokines involved in sleep regulation.²² These findings have been replicated more recently by Liu and colleagues,²³ who found that when older adults with insomnia consumed an identical dose, they increased their sleep time by 85 ± 17 minutes compared with placebo as measured by polysomnography (PSG). In addition, expression of indoleamine 2,3 dioxygenase (IDO) and PGE2 decreased after tart cherry juice consumption. IDO 2,3 dioxygenase degrades tryptophan (a precursor of serotonin). Tryptophan degradation is a known predictor of insomnia and is also related to inflammation. Therefore, it would appear that the compounds in tart cherries could improve the bioavailability of tryptophan for serotonin synthesis, exerting an overall positive effect on sleep and mood.

Similarly to the Pigeon et al study,²⁴ Howatson and colleagues²⁵ reported improvements in 20 healthy participants with no sleep impairments. In this well-controlled placebo-controlled study, they reported improvements in total sleep time (9%) and sleep efficiency (7%) and a 78% reduction in nap time following tart cherry consumption. The findings in this study were attributed to the significantly higher melatonin content in urine following cherry juice consumption compared with placebo.

What athletes can do: Drink two 8-oz servings of tart cherry juice daily. Enjoy a glass in the morning with breakfast and incorporate another in the evening routine to improve sleep quality and duration.

Upper Respiratory Tract Infections

Anecdotal evidence and scientific observation suggest that after exercise, there is an increase among athletes in the reported incidence of symptoms more commonly associated with infections of the upper respiratory airways.²⁶ As previously mentioned, tart cherries are high in numerous phytochemicals that possess anti-inflammatory and antioxidative properties. Consequently, it is conceivable that tart cherries could attenuate the exercise-induced “stress” response, immunity, and upper respiratory tract symptoms (URTS) to exercise. A recent pilot study²⁷ provided the first encouraging evidence to support this premise. The study reported that despite no apparent change in cortisol or mucosal immunity between groups, runners who consumed tart cherry juice had a lower CRP response at 24 hours and 48 hours post-marathon and had no incidence of reported URTS up to 48 hours after the marathon as opposed to the placebo group who had a 50% prevalence of URTS, suggesting that cherries reduced the exercise-induced inflammatory response and the subsequent development of URTS compared with placebo following the race. More research in this area is needed to corroborate these findings before specific recommendations can be made.

Summary

Tart cherries and their constituents have received growing attention for application in sport and exercise, with the beneficial effects appearing to be promising and supported by a growing body of evidence. However, this evidence has only been shown when Montmorency tart cherries have been ingested, and it is worthy to note that other cultivars might not have the same desired effects in terms of exercise recovery. In addition, there appears to be little rationale provided for the dosing strategies employed in the studies. In human exercise studies, dosing strategies

ranged from 7 days pre-exercise to 4 days post-exercise inclusive. In summary, tart cherries appear to provide an efficacious option for assisting with recovery following strenuous exercise. Moreover, as with other polyphenolic-rich foods, tart Montmorency cherries are worth exploring in other health paradigms and clinical pathologies, such as improved cardiovascular disease and aging.

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Discovering the Role of Yoga in Eating Disorder Treatment

by Lisa Diers, RD, E-RYT

The popularity and accessibility of yoga has grown exponentially in the past decade. According to a study by *Yoga Journal*, approximately 20 million Americans older than 18 years practiced yoga in 2012, constituting 8.7% of the adult population.¹ An industry report by IBIS World estimates there are more than 30,000 yoga and Pilates studios in the United States.² Many of the 170+ eating disorder (ED) treatment facilities in the U.S. offer yoga or other mind-body based activities as a component of treatment.³ A 2006 study of 18 residential ED treatment programs in the nation found that two thirds of the programs offered yoga.⁴

Twenty million women and 10 million men in the U.S. suffer from an ED (all diagnosis considered) at some point in life.⁵ Some research indicates that 97% of patients admitted to inpatient ED treatment facilities also meet diagnostic criteria for greater than or equal to one comorbid disorder.⁵ Of those patients, 94% evidenced comorbid mood disorders (largely depression) and 56% evidenced anxiety disorders.⁶

Preliminary research demonstrates the positive effects that yoga may have on the management of anxiety and depression symptoms, including improved body awareness and responsiveness, self-acceptance, emotion regulation, and increased mindfulness.⁷ Given these findings, yoga may have a role as an adjunctive therapy when incorporated into ED treatment. Fortunately, with the growing popularity and accessibility of yoga (via studios, pod casts, Internet videos, DVDs, written materials), it can more easily be incorporated into daily living for ongoing recovery support.

What Is Yoga?

The definition of yoga comes from the Sanskrit root meaning “to join.” Traditionally, yoga seeks to join several parts of an individual’s life into a coherent whole.⁸ Perhaps when traditional yoga is incorporated into ED treatment, it has the potential of helping clients rediscover and reconnect their mind and body in a healthful way.

Traditional yoga is integration: integration of mind, body, breath, and spirit/soul. Yoga is a practice of specific postures (asanas) linked with breath while incorporating a focused intention of moving inward for self-exploration and/or reflection. This practice provides an opportunity to begin learning how one’s mind and body may react to an array of life experiences, thus creating an awareness of behavioral and emotional patterns.⁸ Once yoga is learned on the mat, positive change or a change in unhelpful behavior patterns can begin.

How Yoga Differs From Exercise or Stretching

Yoga differs from exercise in its intentional and mindful movement using particular poses and breathing techniques to support an inward and reflective focus as well as physical benefits. When exercising, someone may not be fully present in mind and body. An example would be watching TV while running on the treadmill. The body and mind are engaged in different ways. Yoga takes the physical and adds the component of listening to the body, self-acceptance, forming the pose to the student *not* the student to the pose, moving inward, and cultivating both mind and body with the power of the breath. In yoga, the mind is not sepa-

rate from the body nor is the body separate from the mind. When yoga is practiced with traditional methods, it is a practice of wholeness.

How Is Yoga Useful in Treating Eating Disorders?

How does yoga relate to ED treatment? An ED can serve as a distraction from unwanted feelings, experiences, and stressors. The needs of the body are ignored to a great degree and the numbing of uncomfortable sensations can occur through a variety of maladaptive coping mechanisms. Of course, these coping skills are highly dangerous and not sustainable. In order to live in recovery, one needs to learn how to cope with intense situations, life stressors, and emotions in a healthier way. Learning about the patterns of the mind and body, awareness of personal triggers, and early signs of urges or dysregulation could prevent, delay, or lessen ED symptoms.

Because yoga embodies the connection between body, mind, and breath and provides a canvas of sorts to explore internal reactions in a nonjudgmental way, it can serve, for many, as a nonthreatening tool to begin healing the emotional and physical body. Bridging the gap between body and mind in this way can aid in developing a nonreactive and curious stance in the face of otherwise harmful thoughts, emotions, and behaviors.⁹ The practice of yoga through mindful movement, meditation, and breathing can serve as a “pause” button creating space to choose how to respond to stress or unhelpful coping mechanisms. At the heart of yoga is acceptance and care for the body, which may ultimately be determined to be helpful in the recovery process. This focus on body appreciation could be helpful in the recovery journey.^{7,9}

Another avenue by which yoga could be useful in ED treatment involves regulation of the nervous system. The prevalence of anxiety and depression in those with an eating disorder is significant⁶ and the seemingly positive effect yoga may have on stress, anxiety, and depression could help people with EDs to manage these symptoms. There is evidence that practices such as yoga can stimulate an underactive parasympathetic nervous system and “increase the inhibitory action of a hypoactive GABA (gamma-aminobutyric acid) system in the brain pathways and structures that are critical for threat perception, emotional regulation, and stress reactivity.”¹⁰ One study further suggests that such practices as vagal nerve stimulation in yoga, which activates the parasympathetic nervous system, could impact stress responses.¹¹ By stimulating the vagal nerve via chanting or specific postures (inversions), yoga may help decrease heart rate and lower blood pressure. These are effective indicators of improved stress response. The practice of yoga improves resting vagal tone, which may help those with depression cope more effectively.¹² Results from a recent pilot study on the effects of a vinyasa yoga class, taken twice weekly for 8 weeks, on affect and stress among college students suggested that yoga practice was associated with acute improvements in this population; positive affect scores (measured by the Positive and Negative Affect Schedule) increased significantly ($P < .05$) and negative affect decreased significantly from pre- to post-yoga ($P < .05$).¹¹ Further research and stronger study designs regarding the role of yoga in anxiety and stress management is needed.¹³ With adequate funding to allow access to strong measurements and study designs, these studies could shed light on prescriptive yoga approaches that could target these common comorbid conditions in ED and potentially help alleviate symptoms that impair ED recovery.

Yoga in ED Treatment: Anecdotes from Professional Experience

Prior to becoming a registered yoga teacher, I practiced as a dietitian specializing in ED treatment for The Emily Program. I learned much about recovery from our clients, and had the privilege to witness their experiences firsthand. Seven years ago, I began teaching yoga in ED treatment at The Emily Program. Even at that time, with only two weekly yoga classes offered by the agency, I saw the impact yoga was having at mealtime, group process, and in individual sessions. What I observed profoundly shaped my vision for yoga in ED treatment. Here are some anecdotal examples of the changes clients exhibited:

- Renegotiation of trauma
- Use of positive coping skills to calm down during high anxiety events (grocery shopping, meals, symptom succession)
- Decreased manifestation of anxiety at mealtimes
- Increased awareness of internal hunger and fullness cues
- Enhanced ability to challenge negative body image, checking, and behaviors
- Reclaiming positive movement (from over-exercising to under-exercising)
- Appreciation of what the body is capable of versus appearance
- Facing fears and challenging old beliefs of self
- Having fun, laughter, joy, feeling hopeful
- Decreased isolation
- Increased awareness of and decreased engagement in comparison (body and food)
- Increased awareness of and decreased engagement in negative self-talk
- Increase in deep breathing and grounding techniques at mealtime
- Utilization of yoga to aid in digestion

Case Examples of Yoga Supporting ED Recovery

While shopping one day, a client noticed her anxiety level increasing as

she navigated the grocery store. She inconspicuously moved into a Forward Fold (Uttanasana). This inversion slowed her heart rate and she experienced feeling more calm and centered. She continued grocery shopping with success.

Another client struggled with the Downward Facing Dog pose (Adho Mukha Svanasana). Typically she would experience disgust for her legs when she was in this posture. After several weeks of practice, she moved into the pose and appreciated the strength of her legs and their ability to support her inverted practice, and she didn't experience the usual judgmental thoughts.

At The Emily Program, yoga is integrated into all levels of treatment. An average week contains more than 40 yoga classes led and facilitated by 16 registered yoga teachers across all locations. Yoga teachers are registered at the 200-hour level or higher and undergo extensive ED-sensitive yoga training. Over the past 6 years The Emily Program has developed yoga in ED training for clinicians (yoga instructors, therapists, dietitians) practicing in ED treatment. Because of the comorbid conditions in the client population (anxiety, depression, personality disorders, trauma, and more), careful consideration, thoughtful technique, specific language, trauma-sensitive options, and creating a safe environment are required of all of our teachers. The poses are adapted to meet the student, not the student to the poses. Individuals of any level of experience, mobility, and body sizes can participate fully. Eating disorders do not discriminate and neither does yoga. Systematic research is needed to comprehensively test the efficacy of yoga in this population.

Practical Application: Tips for Incorporation

Only those who are formally trained and registered should teach yoga. However, if you are a clinician working in ED treatment, showing your client a few grounding and centering

yogic techniques could provide helpful tools to add to the recovery toolbox. Your client should be fully aware and willing to participate. For more information on some suggested poses, check out the following sites: www.emilyprogram.com/blog/tag/yoga, www.youtube.com/user/emilyprogram, or www.yogajournal.com

Following are postures and purported benefits for consideration:

- Mountain Pose (standing or seated)—for grounding and centering
- Downward-facing Dog (traditional, chair or wall)—activates parasympathetic vagal response
- Alternate Nostril Breathing—balances the autonomic nervous system
- Legs up the Wall—calming, decreases swelling
- Wind-Relieving Pose—for relief of constipation and gas discomfort
- Supine Twist—for relief of constipation and gas discomfort
- Heart Openers (on bolster)—counterbalance for withdrawal
- Crescent Moon Pose—stretches intercostal muscles, increasing capacity for deeper breathing

Consider incorporating simple breathing techniques (alternate nostril breathing; noticing the breath; deepening the breath) into or before sessions and at mealtimes. Some clients have increased anxiety during the initial phases of breath integration, so always guide with curiosity and a reminder that these are only suggestions, not requirements.

Be curious and ask your client about their yoga practice:

- Why is the client practicing yoga?
- What is his/her intention?
- Is he/she taking a class that best meets his/her current needs?
- What does the client notice prior, during and after a practice?
- Does the client have a helpful intention, mantra, or quote?
- Can a yoga experience relate to an experience with food, body, shape, exercise, emotion?
- What is the client's hydration before, during and after a class?
- Is the client adapting postures as

needed, or ignoring his/her body?

- Does the studio have mirrors?
- How is this affecting the client's body image and perception?
- What types of messages are being integrated into the class (weight-focused, appearance, competition vs. acceptance, adaptation, modification)?
- Can the client or you discuss concerns or needs with the yoga teacher?

Careful Considerations

Although the healing benefits of yoga are promising, yoga should be incorporated and taught in a thoughtful and skillful way. If incorporated carelessly, it could be traumatizing to the client. Clear communication of needs and outcomes between the yoga teacher, client, and treatment team is a must to provide a safe experience.

The Future of Research

Studies are showing that yoga has the potential for producing positive effects on mental health, although in a 2013 review of studies on the effectiveness of yoga on EDs, Neumark-Sztainer suggests that more research with stronger designs are needed to prove yoga's effectiveness as a supportive treatment and prevention modality for people with EDs.¹⁴ Another review on the effects of yoga on ED symptoms support the need for additional research that is of higher quality and provides specifics on technique and effects of postures and amounts.¹⁵

At The Emily Program, in collaboration with the University of Minnesota's Division of Epidemiology and Community Health, in the School of Public Health, two research studies furthering the exploration of the impact of yoga on EDs are in the data analysis phase. One study involves the evaluation of The Emily Program's popular yoga and body image groups. This is a mixed-methods (quantitative and qualitative) study evaluating the effects of these interventions on different aspects of

participants' body image. The second study is a small randomized, control trial examining the effects of yoga on mealtime anxiety among clients in residential treatment at The Emily Program's Anna Westin House. Findings from both of these studies will contribute to the limited empirical evidence regarding the role of yoga in ED treatment.

Summary

The popularity and health benefits of yoga, together with the principles of ED-sensitive teaching, shed favorable light on the potential advantages of incorporating yoga into ED treatment. Through yoga postures and breathing techniques that focus on autonomic nervous system regulation, neuromuscular re-patterning, observation, choice, behavior modification, distress tolerance, and a lessened or nonreactive response to stressors, shifts in ED thoughts and activities have the opportunity to take place.

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Efficacy of Nutrition Education Within a Cardiac Rehabilitation Program in Eliciting Heart Healthy Diet Changes

by Heather A. Butscher, MS, RDN; Keisha Angell, MS, RDN; and Richard A. Josephson, MD, MS

A leading cause of mortality in Americans is coronary artery disease (CAD). It is estimated that more than 13 million Americans have survived a heart attack. Secondary prevention efforts have been established to help decrease disease progression. One of these efforts involves lifestyle modifications, shown to reduce the risk of future cardiac events. Dietary changes such as reducing saturated fats and *trans* fat are included among these lifestyle changes.¹

The relationships between consumption of total fat or specific types of fatty acids and heart health of cardiac patients have been well established. Overall, dietary recommendations typically suggest limiting total and saturated fat intake to help lower low-density lipoprotein cholesterol (LDL-C) and reduce the risk of CAD.²⁻⁹ The American Association of Cardiovascular and Pulmonary Rehabilitation

(AACVPR) recommends dietary fat intake between 25% to 35% of total daily calories.¹⁰ The state of the science overall suggests that current dietary recommendations can help reduce disease progression.

Data evaluating the efficacy of nutrition education within cardiac rehabilitation programs are limited, but at least one study has shown that nutrition education under the direction of a registered dietitian nutritionist (RDN) can lead to long-lasting favorable changes in diet, body weight, and serum cholesterol.¹¹ According to the results of this 1999 study, the intervention group significantly decreased the intake of saturated fats, and the proportion of energy from fat also decreased.¹¹ The current study reported in this article is similar to the 1999 study in that it examines the relationship between nutrition education and diet outcomes of cardiac rehabilitation patients.

Methods

Participants

Participants were selected from the University Hospitals Case Medical Center (UHCMC) cardiac rehabilitation program if they were considered by AACVPR and the American Heart Association Adult Treatment Panel III (AHA ATP III) to have a high fat ($\geq 30\%$ of energy) intake ($n=138$). Individuals were excluded from the study if they had incomplete surveys ($n=80$). A total of 73 participants were included in the final analysis. This study was approved by the UHCMC Institutional Review Board.

Design

This retrospective study used data from cardiac rehabilitation participants who attended nutrition classes during 2008 through 2012. All classes were taught by the same RDN and incorporated the dietary guidelines of

Table 1. Diet Habit Survey Categorical Score and Dietary Fat Intake

	Percent Fat (% of Total Kcal)	Total Survey Score (Men)	Total Survey Score (Women)
Category 1	>37	< 170	<147
Category 2	30	170-220	147-190
Category 3	25	221-227	191-235
Category 4	20	278-349	236-287
Category 5	10	350-389	288-330

AHA ATP III and the Therapeutic Lifestyle Change diet. Classes were 30 minutes in length, and evaluations were given to assess comprehension.

Twelve nutrition classes were provided as part of the cardiac rehabilitation program during 2008 to early 2012. The total number of cardiac rehabilitation classes attended was recorded, but the exact number of nutrition classes attended was not. Participants who attended ≥ 18 total classes were categorized as having attended at least half of the nutrition classes (group A), because the total number of classes offered was 24. In late 2012, the curriculum was condensed at participants' request; thus, six nutrition classes were offered. An exact number of nutrition classes attended was recorded during this time. Group B subjects included these participants, who were categorized as attending ≤ 5 nutrition classes with 60% attending ≥ 4 nutrition classes. The last group attended no classes, and this group was used as a reference group (group C).

All participants were administered the Diet Habit Survey (DHS) pre- and post-nutrition education. The 40-question survey was created for the Family Heart Study.¹ Each question represents a certain value that, when added collectively, predicts the percentage of energy from fat in the diet. This tool has been validated as a screening tool only to identify dietary fat intake.¹ The survey scores are categorically ranked from a very high-fat diet (>37% of energy) to a very low-fat diet (10% of energy). Table 1

shows the categorical scores and dietary fat intake used in the DHS.

This study examined the impact of nutrition education in participants with DHS fat scores indicating $\geq 30\%$ of energy intake was from fat. The aim was to investigate whether nutrition education as taught by an RDN would change dietary fat intake, as assessed by DHS, among cardiac rehabilitation patients at a university medical center.

Statistical Analysis

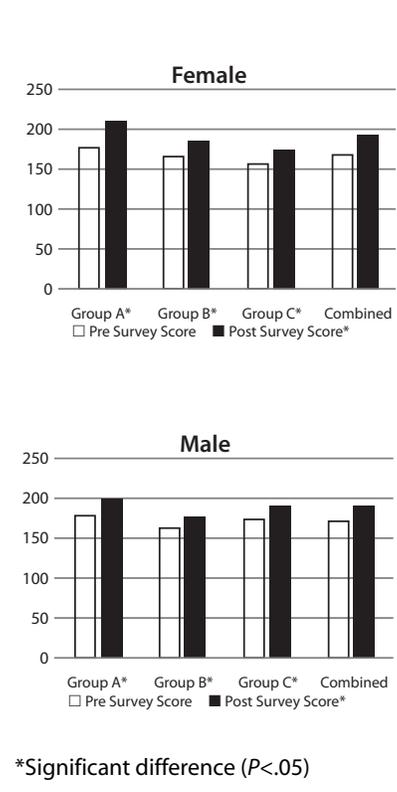
The data were summarized using means \pm standard deviation (SD). One-way ANOVA (analysis of variance) models were used to compare baseline characteristics among groups and differences both before and after education by sexes. Paired *t*-tests were used to compare survey scores pre- and post-intervention within groups. Data were analyzed using the JMP 11.1.1 software. Simple linear regression was used to assess the relationship between change in survey scores and number of classes attended. Spearman's Rho was used to calculate correlations between pre-survey scores and the number of classes attended. Statistical significance was set at $P < .05$.

Results

Participant Characteristics

Participants' baseline characteristics, comorbidities, and entry diagnosis were similar among all groups (Tables 2 and 3). There was a difference ($P = .041$) in percentage of individuals reporting a family history of CAD

Figure 1. Numerical Values from the DHS Scores Recorded Pre- and Post-Cardiac Rehabilitation



among participant group assignments (Table 4). Certain terms shown in the table are outdated, such as PTCA and angioplasty; in current practice, percutaneous coronary intervention replaces these former terms.

Diet Habit Survey Scores and Class Attendance

Baseline scores were similar among all groups and no differences were detected between sexes. The mean DHS scores for men were 178.2 (SD=37.6), 161.8 (SD=35.7), and 174.4 (SD=29.5) for groups A, B, and C, respectively. The mean scores for women were 179.1 (SD=33.0), 166.3 (SD=37.5), and 157.0 (SD=20.2) for groups A, B, and C groups, respectively. The post-survey scores improved in groups A, B, and C ($P < .001$, $.007$, $.001$, respectively), as shown in Figure 1. Categorical changes in percentage of fat were not detected among groups A, B, or C or between sexes ($P = 0.307, 0.349, 0.646$, respectively).

A change in survey score was not associated with number of classes attended among all groups combined ($P=.210$) nor among individuals assigned to the various participation groups. Survey score changes were not related to the total number of classes attended among all groups ($r=.014$).

Lipid Panel

The baseline lipid concentrations were similar among all groups. LDL-C and triglyceride (TG) levels declined ($P=.008$ and $.003$, respectively) after cardiac rehabilitation for all groups (Table 5). No differences in lipid panel between male and female participants among all groups were detected ($P>.05$).

Discussion

Our findings support our hypothesis that nutrition education taught by an RDN during a cardiac rehabilitation program will improve DHS survey scores among participants with initial scores that indicate $\geq 30\%$ dietary energy is derived from fat. DHS scores improved in both higher and lower

Table 2. Baseline Characteristics for Cardiac Rehabilitation Participants

	Group A (18+) (n=27)	Group B (2012) (n=23)	Group C (0) (n=23)	Total Participants (n=73)	P-value
Age (y)	72.4 ± 10.0	72.8 ± 8.9	70.6 ± 9.5	72.0 ± 9.4	.686
Sex (%)					
Male	40.74	60.87	65.20	61.64	.907
Female	59.26	39.13	34.78	38.36	
Weight (kg)					
Pre	84.0 ± 38.8	84.0 ± 38.9	84.1 ± 40.4	93.1 ± 172.1	.439
Post	81.2 ± 48.4	83.4 ± 39.8	83.3 ± 37.7	82.2 ± 42.1	.807
Body mass index					
Pre	28.8 ± 4.0	28.6 ± 4.6	29.5 ± 5.8	28.9 ± 4.8	.792
Post	28.3 ± 4.1	28.5 ± 4.7	28.8 ± 5.5	28.5 ± 4.7	.807
Sedentary lifestyle (%)	74.1	87.0	78.3	79.5	.508
Stress (%)	7.4	0	0	2.7	.130
Smoker (%)	11.1	8.78	8.78	9.6	.945

Table 3. Entry Diagnosis for Cardiac Rehabilitation

	Group A (18+) (n=27) %	Group B (2012) (n=23) %	Group C (0) (n=23) %	All Groups (n=73) %	P-value
Coronary artery bypass graft	22	40	40	33	.510
Myocardial infarction	33	26	13	25	.331
Percutaneous transluminal coronary angioplasty (PTCA)	33	22	40	32	.421
Stable angina	4	4	4	4	.991
Valve replacement	7	9	4	7	.825

Table 4. Comorbidities and Family History of Male and Female Participants in Cardiac Rehabilitation

	Obesity %	Diabetes %	Hypertension %	Hyperlipidemia %	Family History %
Group A (18+) (n=27)	3	2	82	89	19
Group B (2012) (n=23)	13	30	9	91	35
Group C (zero) (n=23)	30	35	9	100	57
Total (n=73)	26	29	88	93	36
<i>P</i> -value	.196	.012	.480	.133	.041

Table 5. Lipid Panel Pre- and Post-Entry into Cardiac Rehabilitation

Lipid Panel Pre/Post	Group A (18+)	Group B (2012)	Group C (Zero)	All Groups	<i>P</i>-value
Total cholesterol (TC)					
Pre	159.3 ± 39.8	152.0 ± 49.9	154.9 ± 41.1	155.6 ± 43.1	.836
Post	156.0 ± 41.0	141.2 ± 43.3	138.2 ± 31.5	145.7 ± 39.3	.226
Low-density lipoprotein cholesterol (LDL-C)					
Pre	95.0 ± 30.3	79.0 ± 35.9	81.4 ± 36.3	85.7 ± 34.3	.200
Post	91.3 ± 30.8	69.0 ± 29.9	69.1 ± 23.3	77.3 ± 30.0	.008
High-density lipoprotein cholesterol (HDL-C)					
Pre	42.4 ± 12.6	45.9 ± 15.1	43.2 ± 14.7	43.7 ± 14.0	.659
Post	42.3 ± 12.7	48.0 ± 17.5	42.9 ± 10.0	44.3 ± 13.8	.292
Triglycerides (TG)					
Pre	106.8 ± 52.1	143.2 ± 65.1	178.0 ± 90.3	140.7 ± 75.3	.453
Post	110.1 ± 48.6	123.6 ± 66.0	131.0 ± 64.5	120.9 ± 59.3	.003

attending groups (A and B), with group A showing the greatest change in survey scores. These data are similar to previous findings, suggesting that nutrition education taught by an RDN, as part of a cardiac rehabilitation program, does influence changes in dietary intake.^{12,13} Our results indicate that despite changes in scores, there were no significant changes of categorical dietary fat intake among all groups.

This result may be influenced by the fact that participants' baseline dietary fat intake was extremely high and the reality of decreasing total fat intake to achieve a change in categorical survey scores would be highly unlikely. Even though categorical change was not significant, dietary improvements were seen. Overall, there was a 47% improvement of DHS scores among all participants. Results indicate that 12% of partici-

pants prior to cardiac rehabilitation were consuming a diet consisting of ≤25% of energy from fat and after attending nutrition education classes 30% were consuming a diet providing ≤25% of energy from fat.

Number of classes attended were not associated with a change in total dietary fat among all participants. This may suggest that attending more classes may improve diet. Further

studies are warranted to determine the number of nutrition classes needed to promote a positive change.

Among all groups, TG concentrations prior to entering cardiac rehabilitation were higher compared with those recorded after completion of the program. Even though the present study was not aimed at lowering TG levels, dietary education and enrollment in cardiac rehabilitation may have influenced the reduction of TG levels in all groups. These differences may also be related to medication prescribed as a result of participating in cardiac rehabilitation.

Limitations

The primary limitation of this study is the small sample size. Given this was a retrospective study, many potential subjects had missing or incomplete data and therefore were excluded from the sample population. Another limitation of this study is the inability to collect information regarding medication prescriptions before, during, or after cardiac rehabilitation for all participants. Drug therapy is generally considered effective in improving lipid profiles in cardiac patients. Because medication-taking was not controlled, it is likely that drug therapy contributed to some improvements in lipids of participants in this study.¹⁴

Finally, the class topics of the nutrition classes that each participant attended were not recorded. Further research is needed in this area to determine which class topics may be most beneficial for reducing total dietary fat intake.

Conclusion

In conclusion, nutrition education classes taught by an RDN as part of a cardiac rehabilitation program reduced dietary fat intake among participants. Further studies are needed to determine the total number of nutrition classes needed to achieve a lower dietary fat intake; higher class attendance may be required to im-

prove dietary changes. As this study suggests, nutrition education improved dietary changes previously shown to be beneficial among cardiac rehabilitation patients, and it should be included as part of a cardiac rehabilitation program.

Heather A. Butscher, MS, RDN, works at University Hospitals Case Medical Center in Cleveland, OH, and has implemented a nutrition program within the cardiac rehabilitation program at UHCMC. Keisha Angell, MS, RDN, is a clinical dietitian at St. Luke's Medical Center in Twin Falls, ID, and is currently working towards obtaining certification as a Pediatric and Nutrition Support Specialist. Richard Josephson, MD, MS, is a professor of medicine at Case Western Reserve University, as well as director of Cardiac Intensive Care and director of Cardiovascular and Pulmonary Rehabilitation at University Hospitals of Cleveland.

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From The Chair

Solidifying Our Strategic Plan and Looking Ahead to Symposium 2016

by Eve Pearson, MBA, RD, CSSD

Did you go to the 2015 Academy Food & Nutrition Conference & Expo™ (FNCE®)? If not, just know that it was amazing, especially for SCAN! Our events were top-notch and there was so much positive chatter about the sports nutrition track. Among some of the many highlights of FNCE®, SCAN donated \$7,216 (\$1 per member) to the Academy Foundation; we had the memorable experience of doing yoga together one morning and you might even see some photos floating around of SCAN members (including me!) line dancing on Tennessee's largest dance floor at the SCAN reception! It made me proud, once again, to be part of this amazing group.

Also know that your Executive Committee is diligently working to solidify our strategic plan that will carry us through the 2016-2019 period. We are defining SCAN's

scope of practice, looking into what areas of wellness our members practice in order to provide you with more useful resources, and identifying the areas of crossover among the subunits to bring them even closer together.

Our next opportunity to gather together will be the 2016 SCAN Symposium, on April 8-10—and it promises to be another superb event where members can greatly expand their knowledge, improve their practices, and enjoy unrivalled networking. Carrying the timely theme of *Prescriptions for Sustainable Health, Performance and Practice*, the final program for the 2016 SCAN Symposium has been released and online registration is now up and running. Be sure to register soon! I know I speak for everyone on the Executive Committee when I say we look forward to seeing you all in Portland!

Conference Highlights

American College of Sports Medicine Annual Meeting

May 26-30, 2015
San Diego, CA

At the 2015 Annual Meeting of American College of Sports Medicine (ACSM), more than 6,000 researchers, educators, sports medicine professionals, and exercise scientists convened to share the latest information. Below are a few of the highlights from the more than 3,500 cutting-edge research presentations. Abstract numbers are shown in parentheses; you can access abstracts at <http://acsmannualmeeting.org/educational-highlights/final-program-and-abstracts/>. ACSM's annual meeting is an excellent place for SCAN dietitians to update their sports nutrition knowledge. ACSM's 2016 meeting will be in Boston, May 31 to June 4. See you there?

■ Is there a relationship between body mass index (BMI) and body composition in collegiate athletes? A study of 172 athletes (92 males) from a variety of sports reports that 35% were classified as overweight and 4% as obese. According to BodPod assessments, only 3.5% were overweight and 3% obese. BMI classification and percent body fat agreed only about 60% of the time in athletes from a variety of sports. The higher the body fat, the more likely the BMI classification would be appropriate. (Abstract 188)

■ An inadequate sports diet is common among runners. Collegiate cross-country runners (30 males, 19 females) who trained about 60 miles per week completed three phone-based, 24-hour food recalls. Based on that information, 37% of the runners met the criteria for energy deficiency (defined as *energy intake less than 90% of total daily energy expenditure*) and 35% had low carbohydrate in-

take (defined as *less than 6 g carbohydrate/kg/day*). How much better could they perform with adequate nutrition? (Abstract 81)

■ Figure competitors go to extremes to lose body fat. A case study of a drug-free amateur female figure competitor indicates that during 20 weeks of preparation she reduced her energy intake by about 500 calories from her baseline intake. She was able to maintain muscle mass while dropping her body fat from 15% to 8.5% (as measured by DEXA). She stopped having menses in the early stages of preparation. (Abstract 84)

■ Approximately 30% of female athletes suffer from iron deficiency (as defined by serum ferritin <20 ug/L or hemoglobin <12g/dL). Iron deficiency commonly results from an iron-poor diet. Given that people with eating disorders commonly have an iron-poor diet because they tend to avoid iron-rich red meats and

iron-enriched breakfast cereals, the question arises: Do eating disorders contribute to the high prevalence of anemia in female athletes? To test this, 91 collegiate female athletes were assessed by the Female Athlete Screening Tool (FAST), a questionnaire that addresses disordered eating attitudes and behaviors. The results suggest that eating disorders were associated with iron deficiency as well as suboptimal performance. Integrating FAST into the pre-season physical assessment could be a wise protocol. (Abstract 87)

■ Although weight loss programs guided by health professionals can be effective, they are also time-consuming and expensive. Can programs that use self-monitoring devices such as the SenseWear Armband be just as effective? When 78 obese adults (31 males) were randomized to either a guided weight loss group, an armband group, or both for 8 weeks, all groups lost weight. The most weight loss occurred in the group who received both personal guidance as well as the armband. Self-monitoring plus professional help can be a winning combination. (Abstract 555)

■ Does yoga help with weight management? A 12-month study with 37 middle-age women compared a reduced-calorie diet plus either 40 minutes of aerobic exercise 5 days a week or 40-minutes aerobic exercise plus an additional yoga session on 3 days. The subjects in the yoga group were more likely to complete the program (95% retention rate vs 61% retention without yoga at 12 mo). They lost more weight and body fat, plus they tended to have greater gains in muscular endurance and flexibility. Encourage your clients to do those downward dogs! (Abstract 557)

■ While nutrition certainly enhances sports performance, so does sleep. A study with athletes who flew from Connecticut to Georgia to perform exercise tests suggests that flying 1 day prior to the event impaired athletic performance. Hence, athletes traveling to an event that crosses time zones would be wise to invest in

more time spent recovering from pre-event jet-lag. While National Collegiate Athletic Association rules allow for travel 48 hours pre-event for college athletes, doing so steals from classroom-time. (Abstract 2987)

■ Are protein supplements (whey + colostrum + leucine) beneficial for untrained men starting a weightlifting program? Results from a study with 27 untrained men who did 4 weeks of resistance training indicate they all had significant improvements in muscle size and strength, but there were no significant differences between those who took the protein supplements versus placebo. This underscores the wisdom of urging clients to spend their money on real food instead of protein supplements. (Abstract 713)

■ Sodium bicarbonate, beetroot, and caffeine are three supplements with potential ergogenic benefits for rowers. If a rower took these supplements all at once, would they cause gastrointestinal (GI) distress? To answer that question, researchers created a supplement protocol, whereby 10 heavyweight elite male rowers practiced with each supplement individually, and then combined one with a second, and then a third supplement. Each rower recorded his intestinal response and any side effects associated with taking the supplement(s) during high-intensity training, low- and high-level competition, and athlete testing. Of the 777 total GI reports, 85% revealed no GI issues, while 8.5% revealed low, 4.5% revealed moderate, and 2.5% revealed severe GI issues. The majority of these problems occurred in the lower intestinal tract and were related to sodium bicarbonate in combination with beetroot. Using this protocol, each athlete was able to determine his unique responses to the supplements, and was thus able to build confidence in creating an effective race-day protocol. (Abstract 717)

■ Bioelectrical impedance analysis (BIA) is commonly used to assess percent body fat. It actually measures body water to predict body fatness.

Given that women retain water pre-menstrually, is pre-menstrual water-weight gain enough to alter the BIA measurement of body fatness? In a group of 13 female collegiate athletes who were tested with the InBody 720 bioelectrical impedance analyzer before, during, and after their menstrual periods, body fat measurements remained stable. The InBody 720 provided reliable estimates of body fatness, regardless of menstrual cycle phase. (Abstract 846)

■ GI distress is a common performance-limiting problem for ultrarunners, probably due to a combination of physiological, mechanical (jostling), and dietary factors. Among 30 participants who recorded their GI symptoms four times throughout the Western States 100-mile run (~161 km), 77% of the runners reported some type of GI issue. The most common symptoms were nausea (53%), belching (40%), flatulence (30%), and vomiting (30%). Race diet was similar in terms of consumption of energy, carbohydrates, and fluids for runners with and without nausea, suggesting that factors other than nutrition might have contributed to the GI symptoms. Each athlete is an experiment of one! (Abstract 852)

■ A gluten-free diet has become trendy among some athletes, even when they do not have celiac disease (and seemingly have no health reasons for avoiding gluten). Are there any advantages for athletes who choose to eat a gluten-free diet? It's doubtful. Among 13 competitive male cyclists with no history of celiac disease or irritable bowel syndrome, a (short-term) gluten-free diet did not improve performance, GI symptoms, well-being, or intestinal injury. (Abstract 856)

■ For the average fitness exerciser, do room-temperature water (22 C degrees), cold water (4 C degrees), and an ice slurry (-1 C degrees) offer similar cooling benefits when consumed during exercise in the heat? In a study with 15 males who did three heat trials to exhaustion on cycle ergometers, the slurry offered an ad-

vantage over room temperature water (35 vs 31 minutes to exhaustion), but it gave no clear advantage over cold water (35 vs 34 minutes to exhaustion). Some of the subjects reported the designated volume of ice

slurry (about 200 mL every 10 minutes) was difficult to consume. Cold water is likely good enough for the average exerciser. (Abstract 801)

Summarized by ACSM member and

sports dietitian Nancy Clark, MS, RD, CSSD, who has a private practice in the Boston-area and is author of *Nancy Clark's Sports Nutrition Guidebook* (see www.nancyclarkrd.com for more information).

Reviews

Eat Like a Champion

Jill Castle, MS, RDN, CDN
AMACOM, 1601 Broadway, New York, NY 10019
www.amacombooks.org
2016, softcover, 246 pp, \$16.96
ISBN-13:978-0-8144-3622-6

Eat Like a Champion is a sports nutrition book for children and adolescent athletes, as well as for parents and coaches. Jill Castle, a registered dietitian and mother of four active children, understands that kids are not mini-adults and tailors her nutrition advice to young athletes. Castle clearly introduces why nutrition plays an important role for active kids and illustrates her advice with case studies that will also be useful to all dietitians. She has a knack for helping athletes and their parents solve the most common nutrition problems.

The book is divided into three parts: nutrition rules and regulations, play-by-play eating, and clearing the hurdles. Each part contains three

chapters that help a young athlete understand the basics of nutrition for peak performance while also providing simple strategies for fueling and hydration. The content helps young athletes recognize the twin demands of fueling for sport and obtaining needed energy and nutrients for normal growth and development. The chapters are peppered with useful charts and tips to make the information meaningful and quickly accessible.

The author provides easy recipes for snacks and healthy drinks, all kid-tested and kid-approved. What makes this book unique is that it boils down all of the evidence-based science on sports nutrition into an easy read for children. Sports participation at every level is growing; 69% of girls and 75% of boys participate in organized sports each year. Yet, there remains limited information on sports nutrition for this population.

This book is well organized with a

logical flow. SCAN members who work with active children can use this book as a one-stop shop for good nutrition practices. The author also addresses controversial topics such as dietary supplements for kids and the challenge of providing healthful snacks at sports venues. The author provides a sample note to parents who provide snacks for their children's games to encourage them to provide fueling snacks in the right portions.

Jill Castle is a registered dietitian nutritionist who is a regular contributor to *Sports Kid* magazine and USA Swimming's Web site and *Splash* magazine. She is the author of *Fearless Feeding* and mom to four active children.

Reviewed by Chris Rosenbloom, PhD, RDN, CSSD, nutrition professor emerita at Georgia State University in Atlanta and editor-in-chief of SCAN's *Sports Nutrition: A Practice Manual for Professionals, 5th edition*.

Research Digest

Saccharide Composition and Ultra-Endurance Triathlon

Wilson PB, Rhodes GS, Ingraham SJ. Saccharide composition of carbohydrates consumed during an ultra-endurance triathlon. *J Am Coll Nutr*. 2015;5:1-10.

Carbohydrate intake between 30 to 60 g h⁻¹ during events lasting longer

than 90 minutes has been shown to enhance performance. Evidence suggests that because glucose and fructose use distinctive intestinal transporters, a glucose-to-fructose range of 1.2:1 to 1:1 may increase exogenous carbohydrate oxidation and reduce gastrointestinal (GI) distress. The purpose of this study was to provide saccharide profiles for common food and beverages consumed dur-

ing an ultra-endurance triathlon and determine whether the amount of glucose and sucrose consumed was associated with GI distress. In this observational study, 54 participants (43 men, 11 women) competing in the Chicago Lakes Triathlon (1.2-mile swim, 56-mile cycle, 13.1-mile run) self-reported food and beverages consumed during the race. Self-reports were verified through collec-

tion of food and beverage packaging and dietary interviews. Glucose and fructose content was determined through manufacturer information, high-performance liquid chromatography, and the U.S. Department of Agriculture database. Participants self-reported GI distress on a 1-10 scale (0 no discomfort, 10 unbearable discomfort). Eighty food and beverages consumed during the race were found to have unique saccharide profiles. Only 8.8% of these foods had the optimal glucose-to-fructose ratio of 1.2:1 to 1:1; 55% had $\geq 3:1$ glucose-to-fructose ratio. The median glucose-to-fructose ratio ingested by participants was 2.9:1 (range 2.4:1-5.3:1). Twenty participants consumed ≥ 50 g h^{-1} during the swim and cycle portion of the race. Approximately 89% of participants reported GI distress by mile 12 of the run. GI distress at mile 1 was positively correlated with glucose intake ($r=0.480$, $P=.032$) and negatively associated with fructose intake ($r=-0.454$, $P=.044$). This study provided information on the glucose-to-fructose ratio of several foods, which can serve as a guide for athletes and practitioners. Athletes participating in ultra-endurance events requiring ingestion of carbohydrate in amounts greater than 50 g h^{-1} may benefit from consuming more foods with lower ratios of glucose to fructose ($<1:1$ to $1.99:1$).

Summarized by Megan Foley, BS, graduate student, Coordinated Master's Program, Sports Nutrition Concentration in the Department of Nutrition and Integrative Physiology, University of Utah, Salt Lake City, UT.

Effects of Protein and Fat on Body Composition, Strength, and Stress in Weightlifters

Helms ER, Zinn C, Rowlands DS, Naidoo R, Cronin J. High-protein, low-fat, short-term diet results in less stress and fatigue than moderate-protein, moderate-fat diet during weight loss in male weightlifters: a pilot study. *Int J Sport Nutr Exerc Metab.* 2015;25:163-170.

Studies suggest that calorie-restricted diets high in protein have the

potential to spare fat-free mass (FFM) in resistance-trained athletes during weight loss. The purpose of this study was to determine the effects of high-protein intake compared with moderate-protein intake on anthropometrics, strength, and psychological stress following a 2-week energy-restricted diet. In this double-blind crossover study, 13 resistance-trained males consumed either a 40% calorie-restricted, carbohydrate-matched high-protein (2.6 g/kg) low-fat (15.4%) (HPLF) diet or a moderate-protein (1.6 g/kg) moderate-fat (36.5%) (MPMF) diet for 2 weeks. Trials were separated by 25 to 49 days. Anthropometrics (height, weight, 8-site skinfold thickness, waist, hip, calf, arm girth, and femur and humerus breadths) and an isometric mid-thigh pull (IMTP) strength assessment were measured 1 day pre- and 1 day post-intervention. Study participants also completed the Profile of Mood States (POMS) and the Daily Analysis of Life Demands of Athletes (DALDA) questionnaires to assess psychological responses. In both treatments, body weight, calculated FFM, and skinfolds sum decreased significantly, but similarly using qualitative analysis. IMTP strength losses were slightly less (1.1%) for the MPMF group and considered "likely trivial." During the intervention, DALDA, POMS fatigue, and TSMS were higher in the MPMF group compared with HPLF group and classified as "likely harmful." In conclusion, the results suggest that during a short-term calorie-restrictive diet in weight-class restricted or aesthetic sports (e.g., weightlifting, bodybuilding, and combat athletics), a high-protein low-fat diet approach provides less stress, fatigue, mood disturbance and diet dissatisfaction than a moderate-protein moderate-fat approach. There were no changes in strength performance or anthropometrics between diets, but further research is warranted to examine a longer calorie-restricted period for significant changes in body composition and performance.

Summarized by Valerie Mey, BS, graduate student, Coordinated Master's Program, Sports Nutrition Concentration

in the Department of Nutrition and Integrative Physiology, University of Utah, Salt Lake City, UT.

Effects of Social Networking Sites and Conventional Media on Body Image Dissatisfaction

Cohen R, Blaszczynski A. Comparative effects of Facebook and conventional media on body image dissatisfaction. *J Eat Disord.* 2015;3:23.

Young women frequently experience body image dissatisfaction (BID), which is closely associated with eating disorders (EDs). BID occurs, in part, from appearance comparison (AC) of societal and personal standards. Consequently, exposure to conventional media (e.g., magazines and television) has been consistently linked to BID. Because social networking sites (SNS) such as Facebook are now the preferred social resource for young adults, and SNS images are perceived as authentic unlike images in conventional media, this study was undertaken to determine whether college-age women were more likely to engage in AC with their SNS peers. In this study, 193 female first-year university students were randomly assigned to view Facebook profiles ($n=102$) or commercial images of models/celebrities ($n=91$) for 5 minutes. Pre- and post-exposure validated questionnaires compared BID, AC, and risk of EDs. Facebook usage had a significantly positive correlation with a higher baseline BID ($P\leq.01$) and risk for ED ($P\leq.05$) as indicated by a score of ≥ 20 on the Eating Attitudes Test (EAT-26). Exposure to Facebook ($P\leq.01$) images and exposure to conventional media ($P\leq.034$) images both significantly impacted BID; however, there was no significant difference in the amount of change in BID the two exposures elicited. These results suggest that when working with adolescents and college-age patients, it is important to remember that all types of media exposure may increase the risk of BID. Use of SNS does not likely cause an ED, but it may help perpetuate BID thoughts and support ED behaviors.

Supporting individuals in reducing SNS time and AC may assist in the treatment of BID and EDs.

Summarized by Ali Spencer, RD, CD, Outpatient Dietitian at Intermountain Medical Center, Murray, UT.

Quality of Life, Weight, and Eating Disorder Symptoms in Severe and Enduring Anorexia Nervosa

Bamford B, Barras C, Sly R, et al. Eating disorder symptoms and quality of life: where should clinicians place their focus in severe and enduring anorexia nervosa? *Int J Eat Disord.* 2015;48:133-138.

Anorexia nervosa (AN) is a difficult condition to treat and becomes increasingly more difficult the longer a patient has the condition. Those who have suffered from AN for 7 or more consecutive years are classified as having severe and enduring anorexia nervosa (SE-AN). Preliminary research suggests Quality of Life (QOL) improvement may be a useful adjunct to successful therapy for this condition. This study examined the relationship between body mass index (BMI), eating disorder (ED) symptoms, and improved QOL to determine

■ Call for Abstractors

The "Research Digest" includes 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.

whether BMI and ED symptoms are predictors of current and future QOL in patients with SE-AN. This study is a secondary analysis of a randomized controlled-trial conducted between 2007 and 2010, in which participants were randomized to receive either cognitive behavioral therapy-AN treatment or specialist supportive clinical management. Sixty-three female SE-AN patients of either restrictive subtype (n=47) or binge-purge

subtype (n=16) received 30 individual outpatient treatment sessions (50 minutes each) focused on QOL improvement over the course of 8 months. Physical assessment (height, weight), the Eating Disorder Examination (EDE) questionnaire, the Eating Disorder Quality of Life (EDQOL), the short form-12 (SF-12), and the Weisman Social Adjustment Scale (WSAS) were administered at 15 weeks, end of treatment, and 6 and 12 months follow-up. Improvement in BMI was associated with improvement across all three QOL questionnaires (EDQOL, SF-12, WSAS) upon treatment completion and at follow-up. There was also an association between improvements in ED symptoms and measures of QOL in all but SF-12. The results of this study suggest that QOL is associated with, and may be directly dependent on, weight gain and behavioral change. Consequently, treatment for SSE-AN may benefit from a combination of weight restoration, improved eating behavior, and QOL improvement, but not solely QOL improvement.

Summarized by Lori Cole, RD, CD, dietitian, The Orthopedic Specialty Hospital, Murray, UT.

SCAN Notables

■ **Angela Grassi, MS, RDN**, received the 2015 Outstanding Nutrition Entrepreneur Award from the Nutrition Entrepreneur Dietetic Practice Group (NEDPG) for providing evidence-based nutrition information and counseling to thousands of women with polycystic ovary syndrome (PCOS) around the world. Her newest book, *The PCOS Nutrition Center Cookbook: 100 Easy and Delicious Whole Food Recipes to Beat PCOS* is now available at www.PCOSnutrition.com.

■ **Ingrid Skoog MS, RD**, has just finished developing the first sports nutrition mobile app, *Your Sport*

Nutrition Coach, which provides users the ability to calculate pre-physical activity, during activity, and recovery nutritional and hydration needs based on individual profile information. It is also capable of generating specific food choices based on personal profile information and preference. Further details can be found at www.yoursportnutritioncoach.com, or the Apple apps store.

■ **Judy Simon MS, RDN**, and **Carrie Dennett, MPH, RDN**, have authored an article on PCOS and its role in reproductive health entitled, "The Role of Polycystic Ovary Syndrome in Re-

productive and Metabolic Health: Overview and Approaches for Treatment," published in the May 2015 *Diabetes Spectrum*, pages 116-120. Judy also recently spoke on nutritional perspectives on eating disorders and hypothalamic amenorrhea at the 2015 American Society of Reproductive Medicine Annual Meeting.

If you have an accomplishment that you would like to be considered for an upcoming issue of PULSE, please contact Michael Stone, MS, at stonemi13@aol.com or Stone59@purdue.edu

Of Further Interest

■ 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 Web site (www.scandpg.org) and click on the link that says "2016 Election Ballot." Online voting polls open **February 1, 2015**; the final date to vote in **February 22, 2015**.

■ View SCAN's Latest Annual Report Online

Members can find the SCAN's Annual Report for fiscal year 2014-2015 posted at www.scandpg.org, under the "About SCAN" tab. 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.

■ News from Wellness/ Cardiovascular RDs Subunit

Here's an update on developments from the Wellness/CV RDs:

• **Attend the 2016 Annual SCAN Symposium.** Building around the theme of sustainability, the upcoming Symposium will feature Wellness/CV-specific presentations from expert researchers and practitioners. See details on sessions related to our subunit and register at www.scandpg.org/2016-symposium/.

• **Watch Webinars and Earn CPEs.** There is always something to learn and webinars are a great way to stay up to date on the latest research and hot topics of interest. We think you'll be particularly interested in checking out these latest webinars: 1) *Red Raspberries: What Makes This Fruit "Super"*; 2) *Food Pairings for Health Benefits: How to Maximize Nutrient Absorption*; and 3) *Heart-Health Benefits of EPA and DHA Omega-3s*.

• **Volunteer Opportunities.** We are always looking for members who are willing to contribute their time and expertise by writing for the newslet-

ter, reviewing webinars, or assisting with wellness and CV-related social media posts. Please reach out to volunteer coordinator Sara Vine (sara.vine@gmail.com) if you would like to get involved.

■ News from DEED Subunit

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

• **DEED e-Newsletter.** By now you should have received the third edition of *Bite by Bite*, which featured an article on credentialing (the CEDRD credential). Be sure to check out this and past editions by logging into the SCAN Web site (www.scandpg.org).

• **Fact Sheets.** You'll find DEED fact sheets on SCAN's Web site. Check back often for the latest offerings. We have two new ones for RDs: 1) *Recognition and Treatment of Deficient Energy Intake Among Athletes*; and 2) *Navigating the Complexity of Weight and Health*.

• **Let's Hear Your Ideas.** We welcome your input! Send your ideas for DEED and upcoming publications to 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:

• **PINES: A Great Opportunity.** Professionals in Nutrition for Exercise and Sports (PINES) is a nonprofit organization that links professionals in nutrition, exercise, and sport around the globe, enhancing excellence in sports nutrition services provided to athletes and active individuals. PINES members reside in more than 30 countries and constitute a variety among sports nutrition professionals that is unique to the field. Rather than replacing national sports nutrition organizations, PINES emphasizes collaboration among existing organizations and mentorship for professionals trying to establish their

own national organization. PINES's aim is to expand the presence of sports nutritionists and dietitians worldwide. For more information go to www.pinesnutrition.org.

• **Fact Sheets.** Check out the fact sheets released during the past year: 1) *Making Weight, Sports Foods, Protein Needs in Athletes*; and 2) *Nutrition for the Injured Athlete*. Stay tuned—we're currently reviewing and updating many of our fact sheets.

• **Don't Miss this Webinar.** SD-USA's latest evidence-based webinar is *Treating the Injured Athlete: Nutrition Strategies to Promote Healing and Recovery*, offering 1 CPEU. For access, go to www.scandpg.org/store/default.aspx?search=Webinars.

• **Next CSSD Exam Windows.** The next exam dates are February 8-29 (excluding President's Day); postmark deadlines are November 6, 2015 to January 5, 2016. Application fee rises with each postmark deadline closer to the exam; for details go to www.cdrnet.org. Check out the 20-minute webinar, *CSSD: Prepare Yourself and Succeed!* The webinar can be accessed under "Sports Nutrition Information" at www.scandpg.org. Click on "Become a CSSD."

• **NATA Partnership.** If you work with athletic trainers, make sure they know about SCAN and all the resources we offer. Encourage them to ask the National Athletic Trainers' Association (NATA) to continue collaborating with SCAN. Each of us plays an important role in the health and performance of athletes. If you have ideas to share, contact Jen Doane, MS, RD, CSSD, at jdoane@anwnutrition.com.

• **Students, Take Note!** Consider earning a graduate degree in a sports nutrition-focused program. You'll find information on this at www.scandpg.org/sports-nutrition-education-programs/. Also, be sure to view the latest interviews from the SCAN Student Corner at www.scandpg.org.

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Upcoming Events

February 5-6, 2016

"Nutrition for Sports, Exercise & Weight Management: What *Really* Works and Why," Arlington, VA. For information: Nancy Clark, MS, RD, CSSD, www.NutritionSportsExerciseCEUs.com

February 26-27, 2016

"Nutrition for Sports, Exercise & Weight Management: What *Really* Works and Why," Arlington, VA. For information: Nancy Clark, MS, RD, CSSD, www.NutritionSportsExerciseCEUs.com

April 2-6, 2016

Experimental Biology (EB) 2016, San Diego, CA. For information: experimentalbiology.org/2015/Home.aspx

March 29-April 1, 2016

ACSM's Health & Fitness Summit & Exposition, Orlando, FL. For information: acsmsummit.org

April 8-10, 2016

Don't miss the exciting 32nd Annual SCAN Symposium, *Prescription for Sustainable Health, Performance and Practice*, at the Hilton Portland and Executive Tower, Portland, OR. Register today! For information: www.scandpg.org/2016-symposium/

May 31-June 4, 2016

ACSM Annual Meeting, World Congress on Exercise is Medicine®, and World Congress on the Basic Sciences of Exercise Fatigue, Boston, MA. For information: www.acsmannualmeeting.org

SCAN'S PULSE

Publication of the Sports, Cardiovascular, and Wellness Nutrition (SCAN) dietetic practice group of the Academy of Nutrition and Dietetics. ISSN: 1528-5707.

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Appropriate announcements are welcome. Deadline for the Summer 2016 issue **March 1, 2015**. Deadline for the Fall 2016 issue: **June 1, 2016**. Manuscripts (original research, review articles, etc.) will be considered for publication. Guidelines for authors are available at www.scandpg.org. E-mail manuscript to the Editor-in-Chief; allow up to 6 weeks for a response.

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Subscriptions: For individuals not eligible for Academy of Nutrition and Dietetic membership: \$50. For institutions: \$100. To subscribe: SCAN Office, 800/249-2875

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(click Nutrition Info tab, then "SCAN'S PULSE")**