

# The Top 10 Questions About Food and Fitness After 50

Christine Rosenbloom, PhD, RDN, FAND  
Bob Murray, PhD, FACSM

Life expectancy for those in the United States who reach 65 years old is an additional 20 years. Healthy food choices, dietary patterns, and physical activity that promotes functional fitness can help make older adults more independent and improve quality of life in their later years. This article answers the top questions about food and fitness after 50 years old that are posed by older adults with answers to help health professionals encourage their patients, clients, friends, and family eat well, move well, and be well. Questions range from “best” foods, diets, and exercise to maintain fitness, as well as questions on hydration, calcium intake, and dietary supplements. *Nutr Today*. 2018;53(4):147–152

Approximately 1 in every 7 persons in the United States is an older adult; in other words, approximately 15% of the population is older than 65 years. In addition, the number of Americans aged 45 to 64 years who will reach 65 years over the next 2 decades increased by 14.9% between 2005 and 2015.<sup>1</sup> Perhaps the most pertinent statistic from the US Department of Health and Human Services is related to life expectancy. Persons reaching age 65 years have an average life expectancy of an additional 19.4 years (20.6 years for females and 18 years for males).<sup>1</sup> We think everyone would agree that they want to live their later years in good health, being functionally fit, and as independent as possible. How we eat and how active we are play a big part in meeting those goals.

**Christine Rosenbloom, PhD, RDN, FAND**, is professor emerita of nutrition at Georgia State University, Atlanta. She currently manages Chris Rosenbloom Food and Nutrition Services, LLC, Hartwell, Georgia, and is the coauthor of *Food & Fitness After 50* (Eatright Press, Academy of Nutrition and Dietetics, 2018).

**Bob Murray, PhD, FACSM**, is managing principal of Sports Science Insights, LLC, a consulting group that works with companies and organizations interested in exercise science and sports nutrition, Crystal Lake, Illinois. He is the coauthor of *Food & Fitness After 50*. He was a cofounder of the Gatorade Sports Science Institute and served as its director for 23 years (1985–2008).

Correspondence: Christine Rosenbloom, PhD, RDN, FAND, 179 Honeysuckle Lane, Hartwell, GA 30643 (chrisrosenbloom@gmail.com).

The authors have no conflicts of interest to disclose.

Copyright © 2018 Wolters Kluwer Health, Inc. All rights reserved.

DOI: 10.1097/NT.0000000000000287

When talking to adults older than 50 years about food and fitness, it can be challenging to separate science from science fiction. Everyone knows they should be active and eat healthfully, but many do not know where to start to get on the right path. In researching and writing our book, *Food & Fitness After 50* (Eatright Press, Academy of Nutrition and Dietetics, 2018), we talked to hundreds of older adults. Whether in focus groups, online, or during presentations, some similar questions pop up. This article presents the top 10 questions along with responses that can help health professionals encourage their clients, patients, family, or friends to eat well, move well, and be well.

## What Is the Best Diet or Best Food for Those Over 50?

There is no “best,” but there are a lot of “goods.” There are no “best” foods or “superfoods” that can fix decades of consuming a poor diet. For older adults, focusing on dietary patterns instead of individual foods presents many healthful-eating plans that give flexibility, balance, and nutrient-rich food choices.<sup>2,3</sup> The following principles apply when choosing a healthful dietary pattern:

- **Inclusion of all energy-containing nutrients.** Carbohydrates, proteins, and fats should be included in any plan. We do not advocate for a high-fat, low-carbohydrate, or high-protein diet, but one that includes a balance of all macronutrients.
- **A focus on nutrient-rich foods.** Declining energy needs with aging means less room for discretionary calories and more emphasis on nutrient-dense foods. To control weight, reducing total energy intake is important, but reducing calories without considering nutrients may lead to suboptimal intakes of vitamins, minerals, and fiber.
- **Concern for disease risk.** Eighty percent of adults 65 years or older have at least 1 chronic condition, whereas 68% have 2 or more. The most common conditions include hypertension (58%), elevated blood cholesterol (47%), arthritis (31%), coronary heart disease (29%), and diabetes (27%).<sup>4</sup> Therefore, dietary patterns for older adults should be beneficial for preventing or managing these disorders.
- **Enjoyment of eating and mealtime.** Eating is necessary for life, but should also give pleasure and enjoyment. The social aspects of sharing meals with family, friends, and neighbors can add enjoyment to life.

Based on these 4 tenets, we recommend 4 different meal plans (dietary patterns). The Table highlights the meal plans and identifies core elements of each plan.

**TABLE Four Dietary Patterns Recommended for Those Older Than 50 Years**

Eating Plan	What Is It?	Focus on These Foods	Eat Less of These Foods
Dietary Approaches to Stop Hypertension (DASH)	An evidence-based approach to prevent and reduce high blood pressure. The plan focuses on foods rich in the minerals calcium, potassium, and magnesium, while reducing sodium intake	Fruits, vegetables, whole grains, low-fat dairy foods, lean meat, poultry, fish, beans, nuts, vegetable oils	Sweets, sugar-sweetened beverages, tropical oils (coconut, palm kernel), salty foods
Mediterranean diet	Focused on cuisines surrounding the Mediterranean Sea; this plan is high in antioxidant and anti-inflammatory foods. Evidence supports this plan for lowering heart disease risk	Fruits, vegetables, whole grains, seafood, legumes, yogurt, poultry, nuts, olive oil	Red meat, processed meat, sweets, sugar-sweetened beverages
Flexitarian diet	Not quite a vegetarian diet, but focused on plant-based eating with the room to be flexible to eat animal foods on occasion	Fruits, vegetables, whole grains, tofu, legumes, lentils, occasional seafood, meat and poultry	Meat and animal foods, sweets
Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND diet)	Combines the best of the DASH plan and Mediterranean diet with the aim to prevent cognitive decline. Research on this diet is considered emerging.	Whole grains, berries, green leafy vegetables, fish, poultry, beans, nuts	Red meat, butter, stick margarine, sweets, pastries, full-fat cheese, fried foods, fast foods

### What is the Best Exercise for Those Over 50?

At any age, the best exercise is whatever is enjoyable that raises the heart rate, quickens breathing, and gets muscles out of their comfort zone. This can be accomplished with prolonged activities such as brisk walking, jogging, swimming, and cycling, with stop-and-go activities such as tennis, volleyball, pickleball, and basketball; with resistance/strength training; with high-intensity interval training; and even with “activity snacks”—bouts of 5 to 10 minutes of exercise (eg, squats, stair climbing, weight lifting, walking, etc) interspersed throughout the day. All of these are examples of exercise—planned, structured, repetitive movements designed to improve fitness—but it is important to note that *physical activity* can also improve fitness and health. By definition, physical activity is different from exercise because, unlike exercise, there is little planning or structure in physical activity, and fitness is not a main objective.<sup>5</sup> These are important practical distinctions because some people are just not interested in formal exercise routines, preferring physical activities that better fit their lifestyle and interests. For example, doing hours of yard work is a physical activity that requires muscles to contract, burns calories (ie, increases energy expenditure), and can maintain or improve physical fitness and body composition. Exercise is great for those who enjoy the structure and challenge of fitness

classes and sports training, but for many older adults, the pleasures and benefits of frequent physical activity can far outweigh the perceived negatives of regular exercise. The best advice is to find exercise routines or physical activities that we enjoy doing and do them on a regular basis, with the goal of getting a total of 30 minutes of exercise/physical activity at least 5 days each week, along with 2 days of some sort of resistance/strength training.<sup>6</sup>

### How Important Is Strength Training if Doing Aerobic Exercise?

Improved aerobic fitness (via exercise or physical activity) is associated with benefits that can truly be described as *antitaging* (compared with leading a sedentary lifestyle). In fact, some experts believe that regular physical activity is more potent than any prescription medication for producing and sustaining changes in our bodies that lead to longer, healthier lives.<sup>7</sup> For example, regular physical activity is associated with reductions in all-cause mortality, cardiovascular disease, type 2 diabetes, breast and colon cancers, hip fractures, depression, and dementia.<sup>8</sup> Research also shows that improved fitness helps us sleep better, feel better, and perform daily tasks more easily.<sup>6</sup> Aerobic fitness can help strengthen muscles—for instance, leg and buttock muscles become stronger in those who

begin regular walking and running programs<sup>9</sup>—but larger gains in muscle strength come from regular resistance training using weights, elastic bands and tubing, strength-training equipment, and body-weight exercises.

Maintaining muscle strength and muscle mass is critically important in reducing the risk of falls as we age and in helping us maintain the capacity for independent living. It is easy to observe that muscle mass and strength gradually decline with age, in large part because we become more sedentary, and in the simplest terms, our bodies gradually lose what they do not use. Research shows that long stretches of sedentary activity characterize the days of most American adults, meaning that skeletal muscles remain virtually unstimulated for the vast majority of each day.<sup>10,11</sup> By one estimate, older adults may spend up to 85% of waking hours being sedentary.<sup>11</sup> The combination of progressive inactivity with age, coupled with the natural decline in muscle mass and strength that typically starts around ages 40 to 50 years, sets the stage in some older adults for sarcopenia—a severe loss of muscle mass and functional capacity—that places overall health and independent living at even greater risk.<sup>12</sup> The loss of muscle mass proceeds at 1% or more per year (depending on overall health and activity level) until approximately age 65 years, when the rate of decline can double.<sup>13,14</sup> Complicating matters further is that muscle strength falls at even greater rates after we reach age 40 years, dropping 2% to 4% each year unless we engage in regular strength training and consume adequate dietary protein that can dramatically reduce the rate of loss.<sup>15</sup> Making matters worse, loss of strength and muscle mass can accelerate during times of catabolic crisis—any injury or illness that requires prolonged bed rest, often accompanied with loss of appetite—when the normal stimuli for muscle growth, repair, and recovery are absent.<sup>11</sup> During times of illness or injury, the absence of regular physical activity, normal diet, and adequate daily protein intake speeds the loss of muscle mass and strength, making full recovery all the more difficult for older people.<sup>16</sup> Those who are already frail prior to a catabolic crisis have a particularly tough time regaining their preillness health and lifestyle, making it all the more important that Americans follow the national recommendations to complete at least 2 sessions of strength training each week.<sup>6</sup>

### Is Protein the Most Important Nutrient for Healthy Aging?

There is no doubt that resistance exercise or strength training is crucial to maintain health as we age, but muscles also need to be fed with high-quality protein, spread throughout the day. The evidence is growing that older adults need more protein than the Recommended Dietary Allowance of 0.8 g/kg per body weight per day to promote muscle health.<sup>17</sup> An international study group was formed

to review dietary protein needs with age, and the following recommendations were made:

- To maintain or regain muscle, those older than 65 years should consume 1.0 to 1.2 g protein/kg per body weight per day.
- Premeal anabolic threshold of dietary protein and amino acids intake is higher in older adults, and the recommended intake is 25 to 30 g of protein per meal with 2.5 g of leucine, the amino acid that serves as an anabolic trigger.<sup>18</sup>

The term *anabolic resistance* has been coined to describe the observance that older muscle responds more slowly to the stimulus provided by dietary protein intake.<sup>19</sup> Increasing protein intake at meals could be the answer to offset anabolic resistance. Consuming 25 to 30 g of protein per meal evenly distributed across meals offers an easy way to promote healthy aging by reducing the risk of sarcopenia and supporting muscle maintenance or growth through resistance exercise.<sup>20</sup>

In practical terms, older adults should consume more protein throughout the day; breakfast generally contains the least amount of protein, with the most eaten at the evening meal.<sup>20,21</sup> However, that does not mean protein is the only crucial nutrient. Sufficient energy and carbohydrate intake is also needed to support protein's role in muscle building and maintenance. Too often older adults try to apply the protein intake strategies adopted by elite athletes or body builders, thinking they need to eat 30 to 40 g of protein per meal, consume additional 20 to 30 g of protein immediately after any exercise bout, and use protein powders. In truth, the optimal timing for protein after exercise is not known, but current recommendations suggest protein within 4 hours of exercise is beneficial.<sup>22</sup> If older adults are consuming 25 to 30 g of protein at evenly spaced meals, there is no need for the addition of protein after exercise. Nutrient-dense foods are preferred to protein powders, so encouraging protein-rich foods (lean meats, seafood, poultry, eggs, dairy foods, nuts, beans, or soy foods) is preferred.

### Is Honey a Healthier Alternative to Sugar?

Everyone has gotten the message that sugar intake should be reduced, but that does not mean that alternatives to sucrose or table sugar are better choices. As hard as it is for people to believe, sugar is sugar. Honey is “natural,” a big buzzword in promoting health. Honey, turbinado sugar, agave nectar, brown rice syrup, and coconut palm sugar are positioned as healthier than sugar, but they all contribute to added sugars and should be consumed in small amounts. It is recommended that added sugars contribute less than 10% of total daily calories; for someone consuming 2000 calories a day, that is less than 50 g of added sugar.<sup>23</sup> That might sound like a lot of sugar, but consider that a healthy-sounding mango smoothie or a sweetened coffee drink can have as much as 30 g of added sugar. Some people who focus on sugar as a “toxic” substance also eliminate naturally occurring sugar. We think it is useful to

remind everyone that naturally occurring sugars in dairy milk, yogurt, fruit, or fruit juice do not need to be avoided as those foods provide nutrients needed by those older than 50 years. Some food companies are beginning to show added sugars on the Nutrition Facts panel, but it will not be until 2020 that the new label showing added sugars will be available on all foods.

### How Important Is Hydration?

Staying well hydrated throughout the day is important at any age to maintain cardiovascular and kidney function, mental acuity, and physical stamina. In older adults, dehydration is associated with confusion, falls, constipation, and pressure ulcers,<sup>24</sup> so drinking sufficient volumes of fluid each day seems an easy way to reduce the risk of a variety of hydration-related health problems and improve overall well-being. Unfortunately, as we age, our thirst mechanism becomes less sensitive to dehydration,<sup>25</sup> as evidenced by the high frequency of dehydration (hypovolemia) in hospital admissions and assisted-living facilities.<sup>26</sup> Physically active older adults who regularly work up a sweat are also prone to dehydration—especially so in warm weather—but if palatable fluids (eg, sports drinks) are easily available, older men and women drink enough to stay well hydrated.<sup>27</sup> Daily fluid needs in adults can vary widely, from a minimum of 2 L (quarts) per day in small, sedentary individuals to more than 10 L per day in large athletes, workers, and soldiers.<sup>28</sup> In the United States, approximately 20% of daily fluid needs is provided by the foods we eat, whereas the remaining 80% comes from a variety of beverages. In that regard, most of the fluid we consume is the result of spontaneous drinking at meals, business meetings, and social occasions, rather than driven by thirst.<sup>28</sup> With that in mind, easy access to a variety of fluids is an important part of keeping older (and younger) adults well hydrated.

### Is Calcium Still Needed for Bone Health as I Age?

There are 2 drivers for the concern over consuming calcium-rich foods and taking calcium supplements. The first is the misunderstanding that serum calcium levels, part of a routine chemical blood panel, are reflective of calcium in the bones. We often hear, “My blood calcium was normal, so my bones must be healthy.” As every health professional knows, blood calcium levels will remain in the normal range despite diminishing bone mineral density. The second concern is that people have read media headlines that dietary calcium—either from foods or supplements—is deposited in the arteries and increases the risk for heart attack. Indeed, headlines such as “Calcium supplements could give you a heart attack” were frequently seen in 2012. Data from Framingham Offspring Study do not support that dietary or supplemental calcium contributes to calcium deposits in arteries. In an observational, prospective study of 670 women and 530 men (average age of

60 years) completed food frequency questionnaires at clinic visits and had computed tomography scans 4 years later to determine calcium deposits.<sup>29</sup> The results of the study did not support the hypothesis that calcium intake from diet and supplements affected vascular calcification of the arteries.

The take-home message is that men and women should get adequate calcium from the diet (or supplements), but more is not better. Postmenopausal women are identified as a group at risk for calcium inadequacy, and while calcium cannot completely halt the bone loss that occurs at menopause, it might help slow the rate of loss.<sup>30</sup> Men, aged 51 to 70 years, need 1 g (1000 mg) of calcium each day, and women in the same age group need 1.2 g (1200 mg). Both men and women older than 70 years should consume 1.2 or 1200 mg of daily calcium.<sup>31</sup> Aim for food as the first calcium source, and use supplements to fill the gap. A good resource is the International Osteoporosis Foundation Calcium Calculator (<https://www.iofbonehealth.org/calcium-calculator>) to learn how much calcium is being consumed.

### What Is Functional Fitness?

Defined as *activities or exercises that prepare us for the demands of everyday life*, the components of functional fitness vary widely among individuals. For example, an 84-year-old woman who lives alone and has to climb stairs each day, open containers, vacuum the floor, reach to high shelves, stoop to pick up the newspaper, kneel to clean under furniture, and take occasional walks in her neighborhood has different functional fitness needs compared with a woman of similar age who does all the same daily activities and also goes to the local YMCA 4 times each week for yoga and Pilates classes, bicycles to local stores, and regularly swims laps at the community pool. The type of activities and exercises we engage in should complement the individual goals for the lifestyles we want to maintain. Even those who choose to lead what others might consider to be physically undemanding lifestyles can benefit enormously by following the national guidelines of 5 days each week of aerobic activity (eg, brisk walking) for a total of at least 30 minutes each day along with two 20-minute sessions of strength training per week.<sup>6</sup> It is important to keep in mind that the 30-minute goal can also be met by being active for 10 minutes 3 days a week and still enjoy the same fitness-related benefits.

### What Balance Exercises Are Best?

Playing with grandkids, working in the yard, and maneuvering through tight spaces in the attic and garage all require a combination of *agility, balance, and coordination*—important ABCs for older adults. Being functionally fit as we age helps to maintain agility, balance, and coordination and thereby reduces the risk of falling and the broken

bones and loss of mobility that often accompany falls in older adults. Agility, balance, and coordination deteriorate with age, and those changes understandably increase the risk of falls.<sup>32</sup> The good news is that agility, balance, and coordination can all be improved with simple exercises such as variations of standing on 1 foot, repeatedly rising from a chair and walking a few steps, moving from lying prone or supine on the floor to standing (with or without the help of nearby furniture), shuffling to each side and backward, practicing dance moves, and participating in sports such as basketball or tennis, along with other activities and exercises that emphasize whole-body movements that require agility, balance, and coordination. Interestingly, maintaining muscle strength and power has only a small impact on agility, balance, and coordination,<sup>16</sup> the practical implication being that we need to engage in specific exercises and activities that stress the ABCs.

### Do I Need to Take Fish Oil Supplements?

We need “fish oils” (omega-3 fatty acids, eicosapentaenoic acid, and docosahexaenoic acid), but the healthy fats can come from seafood, supplements, or a combination of both. The Seafood Nutrition Partnership describes seafood as a “protein with benefits,” and health organizations recommend eating seafood twice a week to obtain approximately 250 mg of eicosapentaenoic acid and docosahexaenoic acid.<sup>33</sup> Fatty fish such as salmon, albacore tuna, trout, sardines, mackerel, herring, oysters, swordfish, Barramundi, crabs, mussels, sea bass and Alaskan pollock are richer in omega-3s than milder fish, such as tilapia/cod, mahi-mahi, haddock, shrimp, or scallops.<sup>33</sup>

For nonfish eaters, supplements may be the answer to obtaining omega-3s. Emerging research suggests that the anti-inflammatory properties of omega-3s may help support muscle protein synthesis and favor muscle protein adaptations in older adults, as sarcopenia is associated with chronic inflammation.<sup>34</sup> In a study, 2 g/d of omega-3 fatty acids augmented gains in muscle mass, strength, and functional ability in older women after 3 months of resistance training.<sup>35</sup> Research is preliminary and emerging, but omega-3 supplementation could be a supportive therapy for maintaining muscle mass.

### CONCLUSION

Food and fitness for those older than 50 years should not be difficult. We are inspired by individuals such as Clarence Bass (<http://www.cbass.com/>), who at 80 years is still body building and is a model of optimal aging. We also admire the men and women who compete in Masters competitions, such as Julia “Hurricane” Hawkins, who is the oldest person to compete in the USA Track & Field Outdoors Master Championships, at 101 years old.<sup>36</sup> It is never too late to eat well, move well, and be well!

### REFERENCES

1. A Profile of Older Americans: 2016. Administration on Aging, Administration for Community Living, US Department of Health and Human Services. <https://www.acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/2016-Profile.pdf>. Accessed April 6, 2018.
2. Tapsell LC, Neale EP, Satija A, Hu FB. Foods, nutrients, and dietary patterns: interconnections and implications for dietary guidelines. *Adv Nutr*. 2016;7:445–454.
3. Freeland-Graves JH, Nitzke S. Academy of Nutrition and Dietetics. Position of the Academy of Nutrition and Dietetics: total diet approach to healthy eating. *J Acad Nutr Diet*. 2013;112(8):307–317.
4. National Council on Aging. Top 10 chronic conditions in adults 65+ and what you can do to prevent or manage them. February 2, 2017. <https://www.ncoa.org/blog/10-common-chronic-diseases-prevention-tips/>. Accessed April 2, 2018.
5. Caspersen C, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public Health Rep*. 1985;100(2):126–131.
6. 2018 Physical Activity Guidelines Scientific Committee. *2018 Physical Activity Guidelines Advisory Committee Scientific Report*. Washington, DC: US Department of Health and Human Services; 2018 <https://health.gov/paguidelines/second-edition/report.aspx>. Accessed March 3, 2018.
7. Fiuza-Luces C, Garatachea N, Berger NA, Lucia A. Exercise is the real polypill. *Physiol*. 2013;28(5):330–358.
8. Sallis RE. Exercise is medicine and physicians need to prescribe it! *Brit J of Sports Med*. 2009;43(1):3–4.
9. Crane JD, Macneil LG, Tamopolsky MA. Long-term aerobic exercise is associated with greater muscle strength throughout the life span. *J Gerontol Series A Biol Sci Med Sci*. 2013;68(6):631–638.
10. Brown WJ, Bauman AE, Owen N. Stand up, sit down, keep moving: turning circles in physical activity research? *Br J Sports Med*. 2009;43(2):86–88.
11. Shad BJ, Wallis G, van Loon LJ, Thompson JL. Exercise prescription for the older population: the interactions between physical activity, sedentary time, and adequate nutrition in maintaining musculoskeletal health. *Maturitas*. 2016;93:78–82.
12. Beaudart C, Zaaria M, Pasleau F, Reginster JY, Bruyere O. Health outcomes of sarcopenia: a systematic review and meta-analysis. *PLoS One*. 2017;12(1):1–16.
13. Granic A, Davies K, Jagger C, Kirkwood TB, Syddall HE, Sayer AA. Grip strength decline and its determinants in the very old: longitudinal findings from the Newcastle 85+ Study. *PLoS One*. 2016;11(9):1–14.
14. Keller K, Engelhardt M. Strength and muscle mass loss with aging process. Age and strength loss. *Muscles Ligament Tend J*. 2013;3(4):346–350.
15. Wall BT, Gorissen SH, Pennings B, et al. Aging is accompanied by a blunted muscle protein synthetic response to protein ingestion. *PLoS One*. 2015;10(11):1–13.
16. Wall BT, Dirks ML, van Loon LJ. Skeletal muscle atrophy during short-term disuse: implications for age-related sarcopenia. *Aging Res Rev*. 2013;12(4):898–906.
17. Courtney-Martin G, Ball RD, Pencherz PB, Elango R. Protein requirements during aging. *Nutrients*. 2016;8:492–502.
18. Bauer J, Biolo G, Cederholm T, et al. Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. *J Am Med Dir Assoc*. 2013;14:542–559.
19. Doering TM, Reaborn PR, Phillips SM, Jenkins DG. Post exercise dietary protein strategies to maximize skeletal muscle response and remodeling in Master’s endurance athletes: a review. *Int J Sports Nutr Exer Metab*. 2016;26:168–178.
20. Phillips SM, Chevalier S, Leidy HJ. Protein “requirements” beyond the RDA: implications for optimizing health. *Appl Physiol Nutr Metab*. 2016;41:565–572.

21. Phillips SM. Nutritional supplements in support of resistance exercise to counter age-related sarcopenia. *Adv Nutr*. 2015;6:452–460.
22. Burd NA, Phillips SM. Protein and exercise. In: Karpinski C, Rosenbloom CA, eds. *Sports Nutrition: A Handbook for Professionals*. 6th ed. Chicago, IL: Academy of Nutrition and Dietetics; 2018:39–58.
23. US Food & Drug Administration. Food Facts: New and Improved Nutrition Facts Label. January 2017. <https://www.fda.gov/downloads/Food/IngredientsPackagingLabeling/Labeling/Nutrition/UCM537178.pdf>. Accessed April 8, 2018.
24. Wotton K, Crannitch K, Munt R. Prevalence, risk factors and strategies to prevent dehydration in older adults. *Contemp Nurse*. 2008;31(1):44–56.
25. Kenney WL, Chiu P. Influence of age on thirst and fluid intake. *Med Sci Sports Exerc*. 2001;33(9):1524–1532.
26. Shimizu M, Kinoshita K, Hattori K, et al. Physical signs of dehydration in the elderly. *Intern Med*. 2012;51:1207–1210.
27. Baker LB, Munce TA, Kenney WL. Sex differences in voluntary fluid intake by older adults during exercise. *Med Sci Sports Exerc*. 2005;37(5):789–796.
28. Institute of Medicine. *Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate*. Washington, DC: National Academies Press; 2004.
29. Samelson EJ, Booth SL, Fox CS, et al. Calcium intake is not associated with increased coronary artery calcification: the Framingham Study. *Am J Clin Nutr*. 2012;96:1274–1280
30. Calcium. National Institutes of Health. Office of Dietary Supplements. <https://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/>. Accessed April 9, 2018.
31. Committee to Review Dietary Reference Intakes for Vitamin D and Calcium, Food and Nutrition Board, Institute of Medicine. *Dietary Reference Intakes for Calcium and Vitamin D*. Washington, DC: National Academy Press; 2010.
32. Muehlbauer T, Gollhofer A, Granacher U. Associations between measures of balance and lower-extremity muscle strength/power in healthy individuals across the lifespan: a systematic review and meta-analysis. *Sports Med*. 2015;45(12):1671–1692.
33. Seafood Nutrition: RDN Toolkit. <http://www.seafoodnutrition.org/health-nutrition-professionals.html>. Accessed April 9, 2018.
34. Lalia AZ, Dasari S, Robinson MM, et al. Influence of omega 3-fatty acids on skeletal muscle protein metabolism and mitochondrial bioenergetics in older adults. *Aging* 2017;9:1096–1115.
35. Rodacki CL, Rodacki AL, Pereira G, et al. Fish-oil supplementation enhances the effects of strength training in elderly women. *Am J Clin Nutr*. 2012;95:428–436.
36. Gegenheimer M. Julia ‘Hurricane’ Hawkins’ breaks world record (again) at the USATF Masters Championships in Baton Rouge. *The Advocate*. July 16, 2017. [http://www.theadvocate.com/baton\\_rouge/sports/article\\_918bc0d2-6a47-11e7-aa04-07caef573443.html](http://www.theadvocate.com/baton_rouge/sports/article_918bc0d2-6a47-11e7-aa04-07caef573443.html). Accessed April 10, 2018.

For more than 93 additional continuing education articles related to NursingCenter.com/CE.

**Instructions:**

- Read the article on page 147.
- The test for this CE activity must be taken online. Tests can not be mailed or faxed.
- You will need to create (its free!) and login to your personal CE Planner account before taking online tests. Your planner will keep track of all your Lippincott Professional Development online CE activities for you.
- There is only one correct answer for each question. A passing score for this test is 13 correct answers. If you pass, you can print your certificate of earned contact hours and access the answer key. If you fail, you have the option of taking the test again at no additional cost.
- For questions, contact Lippincott Professional Development: 1-800-787-8985.

**Registration Deadline:** June 5, 2020

**Continuing Education Information for Registered Dietitians and Dietetic Technicians, Registered:**

The test for this activity for dietetic professionals is located online at <http://alliedhealth.ceconnection.com>. Lippincott Professional Development (LPD) is a Continuing Professional Education (CPE) Accredited Provider with the Commission on Dietetic Registration (CDR), provider number L001. Registered dietitians (RDs) and Dietetic Technicians, Registered (DTRs) will receive 1.0 continuing professional education units (CPEUs) for successful completion of this program/material, CPE Level 2. Dietetics practitioners may submit evaluations of the quality of programs/materials on the CDR website: [www.cdrnet.org](http://www.cdrnet.org). LPD is approved as a provider of continuing education for the Florida Council for Dietetics and Nutrition, CE Broker #50-1223.

**Continuing Education Information for Nurses:**

Lippincott Professional Development will award 1.5 contact hours for this continuing nursing education activity.

The test for this activity for nurses is located at <https://nursing.ceconnection.com>.

Lippincott Professional Development is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center’s Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 1.5 contact hours Lippincott Professional Development is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida CE Broker #50-1223.

**Disclosure Statement:**

The planners have disclosed no financial relationships related to this article.

**Payment:**

- The registration fee for this test is \$17.95.

Thank you Chris!

Nutrition today thanks Christine Rosenbloom PhD RDN FAND for her many informative columns on physical activity, sports and nutrition over the many years she has served as our columnist. We bid her a fond farewell as she resumes new responsibilities associated with her work and her new book, *Food and Fitness After 50*, published by Eatright Press Chicago 2017