

**Cardiovascular
Health and
Well-being**

a dietetic practice group of the
eat right. Academy of Nutrition
and Dietetics
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CPE Opportunities in This Issue

After reading this issue of *Pathways*, current CV-Well DPG members (and nonmembers who purchase this publication) can earn 1 hour of continuing education units (CEUs), level 2 approved by the Commission on Dietetic Registration (CDR). Users must complete the post-test and Critical Thinking Tool in the Academy's Learning Management System (LMS) by May 31, 2024. You can begin this activity by logging in [here](#). The certificate of completion is valid when the CPE self-assessment questionnaire is successfully completed, submitted, and recorded by CV-Well DPG/Academy of Nutrition and Dietetics.

Call for Authors

Pathways, the flagship quarterly publication of CV-Well DPG, welcomes the submission of manuscripts to be considered for research-based or practice-based articles. Research articles summarize and discuss recent scientific evidence related to cardiovascular health (prevention and treatment) and well-being. Practice articles translate evidence into application for dietitians working in various settings, providing tools and recommendations on topics related to cardiovascular health (prevention and treatment) and well-being. Authors may be DPG members or nonmembers. For more details and to complete the **Call for Authors Form**, visit [Pathway's webpage](#). Manuscripts must be prepared and submitted in accordance with *Pathway's* **Guidelines for Authors**, accessed on the same webpage.

CV-Well Said

A Message from the Chair

Your Vital Feedback: Summary of the 2022 Member Survey

by **Lauri O. Byerley, PhD, RDN, FAND, CV-Well Chair**

The Winter edition of *Pathways* has arrived! I hope you're enjoying *Pathways* as much as I do—that's what many of you who completed our member survey stated. This was an important survey that many of you completed last April, and I'd like to focus here on its results. Here's a "Cliff Notes" version:

Nearly 200 members completed the survey and provided feedback. Not bad, and it is much appreciated, as the Executive Committee has used the results as a guide in making decisions. Seventy-seven percent of respondents said CV-Well met their expectations, and they would recommend our group to others—please do! Sixty-three percent felt CV-Well was worth the cost, while 31% were neutral. So if you fell into this group, please let us know what else you would like us to provide.

What benefits opportunities did you find most valuable? Educational webinars were the top choice, with 91% saying these were valuable and 86% saying they wanted the latest topics in nutrition for well-being and/or cardiovascular health. We will continue to offer free continuing professional education (CPE) webinars to CV-Well members.

The next top benefit opportunity was our newsletter, *Pathways*, with 70% saying it was valuable and 67% liking the free continuing education units (CEUs). The virtual workshop was next. Good news: We hope to do another one in the Spring 2023, so stay tuned. Next was *Natural Medicine Database*. We were excited to see so many find it a valuable resource, because it is costly. Please use it more!

We asked about attending FNCE, and 24% of the respondents planned to attend. It ended up about 12% of our members actually attended.

Finally, we asked how you liked to receive communications from us. There were seven options: eBlasts, *Pathways*, CV-Well Discussion Board, LinkedIn, Twitter, Instagram, and others. Eblast came in first (86%), followed by *Pathways* (72%), the discussion board (45%), and the social media options at 14%. Respondents wanted their communications in hard copy form or on Facebook for the "others" options.

We provided opportunities for written comments and received several suggestions, some of which have been implemented. For example, we sent a hard copy of the summer edition of *Pathways*. I can't promise this will happen again, as it is costly. We are working on Fact Sheets and hope to have several out this year.

Since the survey was anonymous and we can't reach you for clarification of a specific suggestion you may have listed, please don't hesitate to contact us at cvwelldpg@eatright.org to give us more details about your suggestion. There were several excellent ones.

Take care, and have a great winter!



CPE Research Article

Recommendation for Dietary Flavan-3-ols Intake and Cardiometabolic Health

by Kristi M. Crowe-White, PhD, RD and Kim S. Stote, PhD, MPH, RDN, CDN

Learning Objectives

- Define dietary bioactive food compounds and describe the process of developing dietary recommendations for these nonessential nutrients
- Identify flavan-3-ols and examine their role in cardiometabolic health
- Translate the guideline for flavan-3-ols and cardiometabolic health into practice

Fruit and vegetable intake is highly associated with reduced incidence of chronic diseases including cardiovascular disease and cancer.¹ While fruits and vegetables contain essential nutrients, their health benefits are widely attributable to the bioactive compounds or nonessential nutrients developed during growth and maturation. According to the National Institutes of Health Office of Dietary Supplements, dietary bioactive compounds are constituents in foods or dietary supplements, other than those needed to meet basic nutrition needs, which are responsible for changes in health status. This classification has further led to fruits and vegetables being termed “functional foods.” Although the definition

of functional foods varies greatly by institution and organization, the definitions presented in the Academy of Nutrition and Dietetics Position Paper on Functional Foods clearly distinguish food from supplement.² To paraphrase the various definitions published, bioactive food compounds are biologically active compounds present in food that have diverse structures and functions exerting benefits beyond basic nutrition; furthermore, dietary bioactive food compounds are not essential to prevent typical deficiency conditions.³

To date, dietary reference intake (DRI) recommendations are set for essential nutrients based on their established metabolic roles and amount needed to prevent deficiencies. For bioactive food compounds, this process is challenged by the chemical diversity of the compounds and their metabolites, making their direct contribution to chronic disease endpoints more difficult to ascertain. Nevertheless, it is critical to follow a rigorous DRI-like process for evaluating the strength of the evidence for bioactive food compounds in relation to disease prevention.⁴

In the development of the first ever recommendation for a bioactive food compound, an expert panel conducted a comprehensive and exhaustive review of the literature guided by a process set forth by the Academy of Nutrition and Dietetics that includes the use of the Evidence to Decision Framework.⁵ It should be noted that this guideline was further strengthened by the use of high quality reviews and data from authoritative scientific bodies including the U.S. Pharmacopeia,⁶ Health Canada,⁷ European Food Safety Authority (EFSA),⁸ and Norwegian Institute of Public Health.⁹

Flavan-3-ols and Cardiometabolic Disease

Cardiometabolic diseases represent a clustering of unique conditions with various etiologies.¹⁰ The clinical manifestations of these conditions interact multiplicatively to increase the collective risk for an individual. As such, risk reduction strategies are receiving increased attention. With prevention as a cornerstone to reduce both incidence and prevalence of chronic diseases, adopting a healthy diet and increasing physical activity represent attractive means for reducing cardiometabolic disease risk. To underscore the role of diet in the prevention of chronic diseases, the American Heart Association has established Strategic Impact Goals designed to improve cardiometabolic health through improvements in diet quality.¹¹

Among the more widely studied and characterized bioactive food compounds are flavan-3-ols, which are present in tea,

apples, pears, berries, and chocolate/cocoa products and are the most consumed flavonoid in the American diet.¹²⁻¹⁵ As secondary metabolites that develop in plants because of stressors in the growing environment, these compounds are highly investigated for their occurrence, metabolism, and biological activity.¹⁶⁻¹⁷ Their beneficial effects are differentiated from other flavonoids by their chemical structure. It is the structural uniqueness that contributes to their modulating effects on specific molecular pathways. For example, flavan-3-ols elicit antioxidant, anti-inflammatory, anti-carcinogenic, and anti-mutagenic properties, along with having modulating roles on cellular enzyme functionality.^{18,19}

Flavan-3-ols exert a multiplicity of effects, and their absorption and subsequent activity can be further enhanced via metabolism by the gut microbiota.²⁰ Additionally, consumption in a food matrix further facilitates their absorption. The influence of the food matrix is underscored by the fact that newly developed food products are designed to mimic the native food matrices among which flavan-3-ols are present to capitalize on these absorption-enhancing properties.²¹ For this reason, along with others related to gastrointestinal distress and liver toxicity from high doses of flavan-3-ols supplements, the newly released guideline for flavan-3-ols is a food-based guideline and not an endorsement for supplemental intake.¹⁸

Evidence Supporting the First Ever Guideline for a Dietary Bioactive Compound

Utilizing a growing body of research highlighting the cardiometabolic benefits of flavan-3-ols with evidence outweighing harms, the first ever guideline for a dietary bioactive compound was developed and published in 2022.¹⁸ Studies informing the guideline were previously reviewed in a recently published systematic review and meta-analysis of 157 randomized controlled trials and 15 cohort studies.²² In the review of these studies as well as other supporting evidence, quality, strength of evidence, and risk-of-bias in reporting were also considered during the guideline development process.

Although numerous cardiometabolic-related outcomes were evaluated across the studies, strength of evidence was stronger for some biomarkers compared with others. The meta-analysis and subsequent guideline were strengthened by use of data from manuscripts of good methodological quality (**Table 1**).²² Upon review of the evidence, it was determined that flavan-3-ol intake in the range of 400 to 600 mg per day may help improve vascular measures, including blood pressure and flow-mediated dilation as well as cholesterol levels and insulin/glucose dynamics.

Table 1. Significant ($P<.05$) Results from Meta-Analysis of Studies* on Flavan-3-ol Intake and Cardiometabolic Health²²

Outcomes Measures	Mean Difference (Summary Estimates)
Systolic blood pressure	-1.29 mmHg (-2.45, -0.13)
Diastolic blood pressure	-1.24 mmHg (-2.13, -0.34)
Acute flow-mediated dilation	1.15% (0.71, 1.59)
Chronic flow-mediated dilation	1.3% (0.59, 2.0)
Total cholesterol	-0.06 mmol/L (-0.11, -0.001)
High-density lipoprotein cholesterol	0.02 mmol/L (0.001, 0.05)
Insulin and glucose homeostasis assessed by HOMA-IR	-0.29 (-0.48, 1.0)

*limited to studies of good methodological quality

HOMA-IR = homeostatic model assessment of insulin resistance

Translating the Guideline into Practice

In guideline development, the expert panel assembled by the Academy of Nutrition and Dietetics was charged with consideration of the health equity of the guideline, including consideration of food costs, barriers and facilitators, resource and feasibility issues, and implementation factors. The fact that flavan-3-ols are among the most highly consumed flavonoids by the general population¹²⁻¹⁵ strengthens the penetrability and acceptability of the guideline; however, primary determinants of intake in the U.S. include race and ethnicity as well as education level and socioeconomic status. For example, tea consumption is reported as highest in older adults, non-Hispanic whites, Asians, and individuals with higher education and socioeconomic status.²³ To potentially overcome this intake disparity, public health messaging to implement the guideline can be strengthened by conveying the variety of flavan-3-ol sources and acknowledging the range of price points and food forms rich in flavan-3-ols.

To help individuals meet the recommended intake of 400 to 600 mg per day of flavan-3-ols, **Table 2** presents a sample menu for incorporating the guideline into practice. To further drill down on one of the most consumed sources of flavan-3-ols,²⁴ **Table 3** provides the flavan-3-ol content of a variety of tea beverages.

Table 2. Sample Meal Plan for Bolstering Flavan-3-ol Intake²⁵

Meal	Flavan-3-ol Intake
BREAKFAST <ul style="list-style-type: none"> Oatmeal Banana, small Black tea 	269 mg
SNACK <ul style="list-style-type: none"> ½ cup blackberries 	31 mg
LUNCH <ul style="list-style-type: none"> Turkey sandwich on multigrain bread, with vegetable garnish and mustard Apple, small 	12 mg
SNACK <ul style="list-style-type: none"> Dark chocolate squares (2) 	30 mg
DINNER <ul style="list-style-type: none"> Blackened grouper with vegetables and rice Red wine, 5 fluid ounces 	23 mg
SNACK <ul style="list-style-type: none"> Mixed nuts Decaf green tea 	152 mg

Table 3. Flavan-3-ol Content in Various Tea Beverages²⁵

Type of Tea (8 fl oz)	Flavan-3-ol Intake (mg)
Tea, black, brewed with tap water	269
Tea, black, brewed with tap water, decaffeinated	124
Tea, black, ready to drink, diet, plain, flavored	39
Tea, black, ready to drink, plain, flavored	65
Tea, green, brewed, flavored	120
Tea, green, brewed, decaffeinated	152
Tea, green, ready to drink	28
Tea, oolong, brewed	117
Tea, white, brewed	163
Tea, instant, unsweetened, powder, prepared	60



Conclusions and Future Directions

Taken collectively, research supports the consumption of flavan-3-ols, present in tea, apples, pears, berries, chocolate, cocoa, and other food products, for cardiovascular and metabolic health benefits. Increasing consumption to 400 to 600 mg of dietary flavan-3-ols per day may help improve blood pressure, lipids, and glucose/insulin homeostasis. Practically speaking, a combination of these foods daily allows for achievable intake in the recommended range to optimize cardiometabolic health. As with any other dietary change, it must be recognized that migrating dietary patterns toward inclusion of key foods should not be underestimated, especially considering the range of biomarker effects that have been improved by flavan-3-ol intake.

Kristi M. Crowe-White, PhD, RD, is associate professor and department chair of the Department of Human Nutrition at The University of Alabama in Tuscaloosa, AL. Her research focuses on redox theory and the interplay between bioactive food compounds, redox and inflammatory balance, and clinical outcomes related to obesity, cardiometabolic disease, and aging. **Kim S. Stote, PhD, MPH, RDN, CDN**, is dean of health professions at the State University of New York (SUNY), Empire State College in Albany, NY, and holds a clinical research appointment at the Albany Stratton VA Medical Center. Her research focuses on the effects of bioactives in berries, cocoa and tea, on cardiometabolic biomarkers in humans.

References

- Wallace TC, Bailey RL, Blumberg JB, et al. Fruits, vegetables, and health: a comprehensive narrative, umbrella review of the science and recommendations for enhanced public policy to improve intake. *Crit Rev Food Sci Nutr*. 2020;60:2174-2211.
- Crowe KM, Francis C. Position of the Academy of Nutrition and Dietetics: Functional foods. *J Acad Nutr Diet*. 2013;113:1096-1103.
- Yates AA, Dwyer JT, Erdman JW, et al. Perspective: Framework for developing recommended intakes of bioactive dietary substances. *Adv Nutr*. 2021;12:1087-1099.
- Lupton JR, Atkinson SA, Chang N, et al. Exploring the benefits and challenges of establishing DRI-like process for bioactives. *Eur J Nutr*. 2014; 53:1-9.
- Papoutsakis C, Moloney L, Sinley RC, et al. Academy of Nutrition and Dietetics methodology for developing evidence-based nutrition practice guidelines. *J Acad Nutr Diet*. 2017;117:794-804.
- Oketch-Rabah HA, Roe AL, Rider CV, et al. United States Pharmacopeia (USP) comprehensive review of the hepatotoxicity of green tea extracts. *Toxicol Rep*. 2020;7: 386-402.
- Health Professional Risk Communication, Green Tea Extract-Containing Natural Health Products - Rare risk of Serious Liver Injury [Internet]. Canada: Government of Canada; c2017. [cited 2022 Nov 11]. Available at: <https://recalls-rappels.canada.ca/en/alert-recall/green-tea-extract-containing-natural-health-products-rare-risk-serious-liver-injury>
- EFSA Panel on Dietetic Products Nutrition and Allergies. Scientific opinion on the substantiation of a health claim related to cocoa flavanols and maintenance of normal endothelium-dependent vasodilation pursuant to Article 13 (5) of Regulation (EC) No 1924/2006. *EFSA Journal*. 2012;10:2809.
- Safety Assessment on Levels of (-)-Epigallocatechin-3-gallate (EGCG) in Green Tea Extracts Used in Food Supplements [Internet]. Norway: Norwegian Institute of Public Health; c2015.
- Albert KG, Eckel RH, Grundy SM, et al. Harmonizing the metabolic syndrome: a joint interim statement of the International Diabetes Federation Task Force on Epidemiology and Prevention; National Heart, Lung, and Blood Institute; American Heart Association; World Heart Federation; International Atherosclerosis Society; International Association for the Study of Obesity. *Circulation*. 2009;120:1640-1645.
- Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and setting national goals for cardiovascular health promotion and disease reduction: The American Heart Association's strategic impact goal through 2020 and beyond. *Circulation*. 2010; 21:586-613.
- Kim K, Vance TM, Chun OK. Estimated intake and major food sources of flavonoids among US adults: Changes between 1999-2002 and 2007-2010 in NHANES. *Eur J Nutr*. 2016;55:833-843.
- Sebastian RS, Wilkinson EC, Goldman JD, et al. A new database facilitates characterization of flavonoid intake, sources, and positive associations with diet quality among US adults. *J Nutr*. 2015;145:1239-1248.
- Bai W, Wang C, Ren C. Intakes of total and individual flavonoids by US adults. *Int J Food Sci Nutr*. 2014;65:9-20.
- Chun OK, Chung SJ, Song WO. Estimated dietary flavonoid intake and major food sources of US adults. *J Nutr*. 2007; 37:1244-1252.
- Pance AN, Diwan AD, Chandra SR. Flavonoids: An overview. *J Nutr Sci*. 2016; 5: e47.
- Aron PM, Kennedy JA. Flavan-3-ols: Nature, occurrence and biological activity. *Mol Nutr Food Res*. 2008;52:79-104.
- Crowe-White KM, Evans LW, Kuhnle GGC, et al. Flavan-3-ols and cardiometabolic health: First ever dietary bioactive guideline. *Adv Nutr*. E-pub ahead of print. doi: 10.1093/advances/nmac105
- Ciumarneau L, Milaciu MV, Runcan O, et al. The effects of flavonoids in cardiovascular diseases. *Molecules*. 2020;25:4320.
- Mozaffarian D, Wu JHY. Flavonoids, dairy foods, and cardiovascular and metabolic health: a review of emerging biologic pathways. *Circ Res*. 2018;122: 369-384.
- Crowe KM. Designing functional foods with bioactive polyphenols: Highlighting lessons learned from original plant matrices. *J Hum Nutr Food Sci*. 2013; 1:1018.
- Raman G, Avendano EE, Chen S, et al. Dietary intakes of flavan-3-ols and cardiometabolic health: a systematic review and meta-analysis of randomized trials and prospective cohort studies. *Am J Clin Nutr*. 2019;110:1067-1078.
- Vieux F, Maillot M, Rehm CD, et al. Flavonoid intakes in the US diet are linked to higher socioeconomic status and to tea consumption: Analyses of NHANES 2011-16 data. *J Nutr*. 2020; 150:2147-2155.
- Huang Q, Braffett BH, Simmens SJ, et al. Dietary polyphenol intake in US adults and 10-year trends: 2007-2016. *J Acad Nutr Diet*. 2020;120:1821-1833.
- Haytowitz DB, Wu X, Bhagwat S. USDA Database for the flavonoid content of selected foods, Release 3.3 [Internet]. Washington (DC): U.S. Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory Home Page. [cited 2022 Nov 11]. Available at: <http://www.ars.usda.gov/nutrientdata/flav>

CPE Practice Article

Using Neck Circumference in Determining Body Fat Percentage

by Leah Little, RD and Sharon Smalling, MPH, RD

Learning Objectives

- Describe the limitations of different anthropometric measurements in assessing body fat
- Explain how to use neck circumference measurement in practice.

Many different methods to determine body fat percentage are available to practitioners today. Common methods for characterizing obesity in adults include body mass index (BMI), waist circumference (WC), waist-to-hip ratio (WHR), skin-fold thickness, and waist to height ratio (WHtR).¹ In considering these methods, it is important to be aware of their use and potential limitations.

Body Mass Index, Waist Measurements, and Weight

Body mass index and waist circumference are widely used together, as higher WC values are often associated with increased BMI values. However, it may be inaccurate to use a single value of BMI as a marker for abdominal obesity due to the wide range of values and their variability between individuals. Moreover, any associated value of WC can vary considerably. While WC has the potential to estimate risk of disease, given that excessive fat in the abdominal region places individuals at a higher risk for developing obesity-related conditions, it is not a diagnostic tool.

Measuring WC can be complicated by lumbar lordosis; additionally, hip circumference measurements used for calculating WHR may vary due to a pannus stomach, in which

extra skin or fat deposits caused by pregnancy, obesity, or weight loss hang from the stomach area on the abdomen.² Measurement of WC and hip circumference may also be affected by bloating, being hungry, wearing heavy clothing, or even respiratory movement during measurement.³

Using an individual's body weight alone may not be a good indicator of health status because it cannot distinguish between weight from body fat versus weight from lean muscle mass. Instead, using body fat as an indicator of health status may be more useful. Body fat estimation is often conducted using bioelectrical impedance, underwater weighing, dual-energy X-ray absorptiometry (DXA), or skinfold thickness. These methods are accurate but can be costly or time consuming.⁴

Skinfold Thickness Method

The most common method used, skinfold thickness, uses a caliper to measure the thickness of fat in several regions of the body including the biceps, triceps, subscapular, and suprailiac.⁵ Skinfold thickness measurements have great variability dependent on practitioner expertise and training. Also, it can be difficult to maintain consistency between evaluators with a particular fold of skin, and in very obese individuals the calipers may be too small for the size of the skinfold. A significant limitation of skinfold thickness assessment is that fat at the site used may not reflect fat stores at other sites and may not be reflective of the amount of visceral fat around internal organs of the body.⁵

Neck Circumference Method

Alternatively, measurement of neck circumference (NC) is a simple and easy method for assessing obesity and estimating the amount of body fat in an individual. NC measurement can be a clinically relevant tool as it is an index of upper-body subcutaneous adipose distribution. Upper body obesity tends to be more strongly associated with diabetes, glucose intolerance, and hypertriglyceridemia than lower body obesity.^{6,7}

NC is easy to measure, and it is inexpensive and noninvasive. Moreover, it does not vary throughout the day as does WC.⁸ NC is measured using a measuring tape, an inelastic tape, or a non-extensible flexible anthropometric tape below the cricoid cartilage, which is below the laryngeal prominence or at the midpoint of the neck.

Research on Neck Circumference Measurement

Emerging evidence has shown NC to be a predictor of overweight and obesity. Research has demonstrated an association between higher NC and higher BMI and WC.^{6,7} NC has also been identified

as being positively correlated with insulin resistance, metabolic syndrome, hypertension, decreased high density lipoprotein cholesterol (HDL-C) concentrations, and increased triglyceride concentrations.^{5,6} In a study conducted in 260 adolescents (10-14 y) who had excess body weight and excess body fat, NC was associated with a higher percentage of body fat, weight, and BMI. It was also positively correlated with fasting insulin, blood pressure, and triglycerides and negatively correlated with HDL-C concentrations. Researchers concluded that NC was a valid predictor for the presence of excess body fat in both girls and boys, and was useful in identifying obese individuals. This study is important due to the ongoing consideration that health during adolescence is predictive of health status in adulthood.⁸

Another study involving 411 adult volunteers showed that NC was a more accurate measure of central adiposity than BMI and was independently correlated with visceral adiposity. The investigators also found that volunteers with a high NC were more likely to have diabetes, hypertension, and cardiovascular disease. It was concluded that NC could be used as a simple screening tool to identify those who are overweight and obese.⁶

Using NC Measurement in Practice

How can NC be used with patients in everyday practice to determine the amount of body fat contributing to their weight? A simple method developed by the U.S. Navy SEALs can be applied using NC as a component of a battery of circumferences. This approach requires data on gender, height, body weight, and depending on the gender, circumferences of the abdomen, hip, waist, and neck. In males, it uses the abdomen, neck, and height measurements; in females, it uses waist, hip, neck, and height measurements.

In this method, NC measurements are obtained using a non-stretchable tape measure placed just below the larynx, perpendicular to the long axis of the neck. Height is measured with the patient standing on a flat surface with the chin parallel to the floor and recorded to the nearest ½ inch. Weight is measured without shoes and rounded to the nearest pound. All circumference measurements (neck, abdomen, waist, hip) are taken three times in sequential order to ensure accuracy. In males, one complete set of abdomen and neck measurements is obtained and continued until three sets are recorded, not three abdomen followed by three neck measurements. In females, a complete set of waist, hip, and neck measurements is obtained, using the same procedure. Circumference measurements are recorded to the nearest ½ inch, with the average taken from each. It is important to note that abdomen, waist, and hip measurements are all rounded *down* to the nearest ½ inch and neck circumference is rounded *up* to the nearest ½ inch.⁹ After all measurements are obtained, a circumference value is calculated to use with height to determine body fat percent on a provided set of tables for men and women. These circumference values are then found in accordance with the person's gender and height.⁹

During the Cardiac Rehabilitation dietetic internship rotation of the first author (LL) of this article, this method was tested on several patients who presented with overweight, obesity, hyperlipidemia, and diabetes. Height, weight, hip, and waist measurements had been obtained. After measuring NC, we calculated circumference values and applied them to the tables to determine body fat. We used body fat percent noted in the patients' medical records (measured by exercise specialists) for comparison. Using the same procedure each time, three of the four values tested were consistent with those measured by the exercise specialist.

Summary

Some of today's most commonly utilized tools to measure obesity can be difficult to use and have limitations. As an alternative approach, neck circumference measurement can be used in combination with waist and hip circumference in routine clinical practice to estimate percent of body fat in patients. This value may be helpful in discussing body fat goals with patients to aid in improving their health.

Leah Little, RD, was a dietetic intern at Texas A&M University at the time of this writing and is now a registered dietitian at Baylor Scott and White Medical Center, in College Station, TX. **Sharon Smalling, MPH, RD**, recently retired as dietitian for the Memorial Hermann Hospital Cardiac and Pulmonary Rehabilitation Programs, Texas Medical Center, Houston. The authors have reported no conflicts of interest.

References

1. Verma M, Rajput M, Sahoo, SS, Kaur N. Neck circumference: independent predictor for overweight and obesity in adult population. *Indian J Community Med*. 2017;42:209-213.
2. Borel AL, Coumes S, Reche F, et al. Waist, neck circumferences, waist-to-hip ratio: which is the best cardiometabolic risk marker in women with severe obesity? The SOON cohort. *PLoS ONE*. 2018;13:e0206617.
3. Zhou J, Ge H, Zhu M, et al. Neck circumference as an independent predictive contributor to cardio-metabolic syndrome. *Cardiovascular Diabetology*. 2013;12:76. <https://cardiab.biomedcentral.com/track/pdf/10.1186/1475-2840-12-76.pdf>
4. Shaheen A, Javed N, Azam F, et al. Comparison of bioelectrical impedance and navy seal formula to measure body composition in medical students. *Cureus*. 2019;11: e4723.
5. Eaton-Evans, J. Nutritional assessment: anthropometry. In Caballero B, ed: *Encyclopedia of Human Nutrition (third edition)*. 2013;227-232.
6. Saka M, Turker P, Ercan A, et al. Is neck circumference measurement an indicator for abdominal obesity? A pilot study on Turkish adults. *Afr Health Sci*. 2014;14:570-575.
7. Ben-Noun L, Sohar E, Laor A. Neck circumference as a simple screening measure for identifying overweight and obese patients. *Obesity*. 2012;9:470-477.
8. Goncalves VSS, de Faria ER, Franceschini S, et al. Neck circumference as a predictor of excess body fat and cardiovascular risk factors in adolescents. *Rev Nutr*. 2014;27:161-171.
9. Appendix B standard methods for determining body fat using body circumferences, height, and weight. <https://550cord.com/army-weight-control-program-ar-600-9/standard-methods-determining-body-fat/>. Accessed October 27, 2021.

CV-Well Equipped

New Products, Tools, and Trends

Dietary Supplement Headwinds

by **Lauri O. Byerley, PhD, RDN, FAND** and **Jennifer Burris, PhD, RDN, CSSD, CDCES**

Have you ever been to a party and the question, “What do you do?” comes up? Immediately after telling them you’re a dietitian, the barrage of questions commences. Haven’t we all been in that position? How often are you asked if you would recommend a supplement?

Although the actual motivations for taking a supplement are complex, popular trends suggest many people are willing to pop a pill in lieu of eating right. Because over-the-counter dietary supplements are big business, it is helpful for RDNs to examine supplement trends. In 2021, the supplement market was worth \$151.9 billion, more than the US government’s discretionary outlay (\$140 billion) for health.¹ From 2022 to 2030, the supplement market is expected to grow at 8.9%²—a growth rate that surpasses the current inflation rate of 7.7%³ In 2026, dietary supplements are expected to generate more than \$306.8 billion,⁴ and there is no indication of this market slowing down.

These findings are interesting, given scientific evidence has generally demonstrated minimal health benefits and some health risks to consuming supplements.⁵ Although keeping both safety and efficacy in mind is essential, RDNs recognize that most supplements are likely safe for consumption and in some cases beneficial. Thus, whether we love or hate supplements, RDNs need to keep up to date on trends and the scientific evidence, and also be aware of any novel supplements that may make an appearance in 2023.

What’s Expected for 2023 and Beyond?

Vitamins, as an ingredient, dominate the market.² Vitamins are typically thought of as something added to vitamin and mineral pills, but you can find vitamins in many other supplements and foods. For example, energy drinks and protein supplements routinely contain vitamins.

Proteins and amino acids are expected to increase by 13.4%, a larger increase than for any other supplement category.² Driving this market are countless sports enthusiasts who generally consider protein and amino acid supplements to be must-haves to improve athletic performance.

Energy and weight management products continue to be big news, although they are not growing as fast as other segments of the supplement market.² Childhood obesity



is a serious public health concern in the US. Thus, it is not surprising that children are expected to drive the interest in the energy and weight management supplement market.² Fifty-five percent of obese children remain obese into adolescence and 80% remain obese into adulthood.⁶ These staggering numbers suggest energy and weight management supplements will be popular for many years.

Interestingly, many plant-based proteins are entering the market, and some researchers predict this market will grow to 17.4 billion by 2027.⁷ We can probably all agree that heart health is something everyone should be talking about! One of the drivers in this market is the rise in vegetarianism and the overall concerns associated with cardiovascular disease, as many consumers believe that plant-based proteins will improve their overall well-being.

Prebiotics and probiotics are commonplace now, but the revenue generated from these products is much lower compared with the supplement categories previously discussed.⁸ The FDA may regulate probiotics as a dietary supplement, a food ingredient, or a drug,⁹ which may limit the growth of this market. Vitamins, proteins, amino acids, energy, weight management, and plant-based supplements do not have these extra regulations.

What's Driving Increased Sales and Consumption of Dietary Supplements?

In part, consumers are increasingly aware of and attentive to their health and well-being.¹⁰ In addition, consumers live hectic lives with busy schedules and less time to plan healthy meals. Interestingly, the aging millennials and their interest in health and diet is also contributing to the rise of dietary supplement sales.¹¹ Taken together, consumers are depending more on dietary supplements to fulfill their nutrient needs.

Even more alarming, consumers are using supplements as their “drug of choice” and/or replacing their prescription drugs with a supplement. For example, in a recent randomized clinical trial, investigators reported that common supplements (fish oil, cinnamon, garlic, turmeric, plant sterols, or red yeast) are often used to replace the cholesterol-lowering drug rosuvastatin. Unfortunately, these supplements do not have the same LDL-cholesterol lowering effects as the pharmaceutical intervention.¹²

There's good news for CV-Well members: CV-Well provides the *Natural Medicines Database* to members for free! This database is a fantastic resource for evaluating and reviewing scientific evidence on supplements. But, of course, it is essential to review the scientific evidence for specific supplements.

So, this is the headwind we are facing. As the nutrition authority, we can continue to advocate for “food first” but also recognize that our patients, clients, students, friends, family, and colleagues are interested in the potential role that dietary

supplements could play in promoting health and wellness. Thus, we must let out our sails to catch this headwind and guide the ship to safer, healthier dietary waters to help our patients/clients make the most appropriate decisions for their lifestyle and health needs.

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References

1. Congressional Budget Office. <https://www.cbo.gov/publication/58269>.
2. Grand View Research. Dietary Supplements Market Size, Share & Trends Analysis Report by Ingredient (Vitamins, Minerals), by Form, by Application, by End User, by Distribution Channel, by Region, and Segment Forecasts, 2022-2030. (2022). Available at: <https://www.grandviewresearch.com/industry-analysis/dietary-supplements-market>.
3. US Bureau of Labor Statistics. Consumer Price Index. (2022). Available at: <https://www.bls.gov/cpi/>.
4. FnF Research (Fact and Factors Research). Dietary/Nutritional Supplements Market Size & Share Predicted to be Worth \$306.8 Billion by 2026. (2021). Available at: <https://www.globenewswire.com>.
5. Cohen PA. The supplement paradox: negligible benefits, robust consumption. *JAMA*. 2016;316:1453-1454.
6. Simmonds M, Llewellyn A, Owen CG, et al. Predicting adult obesity from childhood obesity: a systematic review and meta-analysis. *Obes Rev*. 2016;17:95-107.
7. Markets and Markets. Plant-based Protein Market by Source (Soy, Wheat & Pea), Type isolates, Concentrates, & Textured), Application (Food [Meat Alternatives, Dairy Alternatives, Performance Nutrition & Others] and Feed), Form, Nature and Region—Global Forecast to 2027). (2022). Available at: <https://www.marketsandmarkets.com>.
8. Grand View Research. Probiotics Market Size, Share & Trends Analysis Report by Product (Probiotic Food & Beverages, Probiotic Dietary Supplements), by Ingredient (Bacteria, Yeast), by End Use, by Distribution Channel, and Segment Forecasts, 2021-2030. (2022). Available at: <https://www.grandviewresearch.com>.
9. National Center for Complementary and Integrative Health. Probiotics: What You Need to Know. December 12, 2022. Available at: <https://www.nccih.nih.gov/health/probiotics-what-you-need-to-know>.
10. Nielsen IQ. An inside look into the global consumer health and wellness revolution. (October 28, 2021). Available at: <https://nielseniq.com/global/en/insights/report/2021/an-inside-look-into-the-2021-global-consumer-health-and-wellness-revolution/>.
11. Fortune Business Insights. May 2021. Vitamins and Supplements Market Size, Share & COVID-19 Impact Analysis, by Type (Multivitamins, Calcium Supplements, Pediatric Supplements, and Others), Form (Capsule, Tablet, Powder, and Liquid & Gel), Distribution Channel (Supermarkets, Convenience Stores, Specialty Stores, and Online Retailers), and Regional Forecast, 2021-2028.
12. Laffin L, Bruemmer D, Garcia M, et al. Comparative effects of low-dose rosuvastatin, placebo and dietary supplements on lipids and inflammatory biomarkers. *J Am Coll Cardiol*. Nov 2022. <https://doi.org/10.1016/j.jacc.2022.10.013>.

CV-Well Informed

Policy, Advocacy, & Payment Services

**by Geeta Sikand, MA, RDN, FAND, FNLA, CLS, CDE,
CV-Well Policy and Advocacy Leader,
and Carol Bradley, PhD, RDN, BCBA, FAND, CV-Well
Payment Specialist**

Academy Commends USDA's New Virtual ASCEND Initiative

Launched in December, the U.S. Department of Agriculture's new Agricultural Science Center of Excellence for Nutrition and Diet for Better Health (ASCEND) aims to accelerate research on diet-related chronic diseases, including cancer. This new initiative aligns with the Academy's mission and the recommendations submitted for the recent White House Conference on Hunger, Nutrition, and Health.

The long-term goal of ASCEND is to improve the health and well-being of communities across the country, especially underrepresented communities. This new virtual nutrition center of excellence addresses one of the White House's commitments outlined in the National Strategy on Hunger, Nutrition, and Health to end hunger and reduce diet-related diseases by 2030.

Combatting Medicare Payment Rate Cuts

While deep cuts to Medicare Part B payment rates to RDNs and other providers were mostly averted for 2022, these cuts were merely pushed back rather than resolved, and more cuts loom in 2023. The Academy continues to work with a diverse coalition of Medicare provider groups to lobby for short-and long-term solutions.

Attend "Payment and Reimbursement Office Hours"

If you have a question about payment, reimbursement, or coverage for nutrition services, Academy staff experts on payment and reimbursement issues can help. Attend the Academy's weekly Payment and Reimbursement Office Hours every Wednesday from 3 to 4 pm ET and you can ask questions or make comments on this topic, however big or small. Use this link to join.

In addition, the Academy continues to advocate for regulatory policies that protect consumers and ensure patients that health care services are provided by qualified practitioners. Turn to the Academy's staff experts on consumer protection and licensure every Wednesday from 2 to 3 pm to ask questions, get updates, or voice concerns about consumer protection and professional regulation issues. Use the updated meeting link (as of October 28) to join every Wednesday from 2 to 3 pm ET.



CV-Well Done

Members in the Spotlight

Interviewed by Jean Storlie, MS, RD, CV-Well Leadership Cultivation Director

This issue spotlights Enette Larson-Meyer, PhD, RD, FACSM, whose accomplished career blends research, academia, and service to her profession.

Enette Larson-Meyer is at home in the lab, the classroom, and dietetic practice groups. As director of Nutrition and Exercise (NEM) Laboratory and director of Master of Science in Nutrition and Dietetics (MSND) program at Virginia Tech, Enette teaches, conducts research, and works with both doctoral and MSND students. Throughout her career, Enette has been active in the American College of Sports Medicine and several Academy practice groups (SCAN, CV-Well, Vegetarian Nutrition, Research), and is an associate editor for *Medicine & Science in Sports & Exercise*.

What spurred your interest in pursuing a career in nutrition and dietetics?

My father had a copy of *The Complete Book for Running* by the late Jim Fixx. The cover showed his muscle-defined legs, and my teenage self wanted to have legs like him. This fueled weight training in high school and running in college. Fixx's premature death in 1984 from a heart attack was a major reason I decided to seek a career in nutrition and exercise. The story was that he had a strong family history of heart disease and emphasized running but not necessarily a healthy diet.

What's the most enjoyable part of your work?

I enjoy the intersection between research and teaching future professionals about science and the scientific process. My research is mostly applied and often originates from my observations or my client's questions.

What accomplishments are you most proud of in your career?

The completion of every clinical study is always a significant accomplishment. After working as a team to meticulously collect data, we now get to analyze the data, share the results, and hopefully either benefit practice or stimulate



others to investigate the topic (or both). Other noteworthy achievements include coauthoring two editions of my book, now titled *Plant Based Sports Nutrition* (Human Kinetics, 2020) and serving on two International Olympic Committee sports nutrition consensus panels (2010 and 2017). In the process I've met the greatest scientists and dietitians who have helped fuel my career.

What advice do you have for newcomers to our field?

When I was a dietetic intern at Massachusetts General Hospital, a medical student asked me about food sources of folate. I had no idea how to answer him. I was embarrassed for myself and also felt I had let down the dietetics profession. From then on, I vowed to always be on top of foundational knowledge. For young practitioners, I stress the importance of having a strong foundation in the basic sciences, including chemistry, biochemistry, physiology, endocrinology, and immunology ... and knowing nutrient-rich food sources.

What are your keys to well-being?

In my younger days, I was a fairly competitive road cyclist. As I've gotten older I'm less competitive (or at least I think I am) and enjoy trail running with my Australian Shepherd, flat-water kayaking, weight training, gardening, yoga, and learning about viniculture and beer brewing.

Why did you decide to get involved in CV-Well?

I have many close colleagues in CV-Well. So many have motivated me in my career as mentors, students, and friends. My advice: Get involved with this amazing group of dietitians!

CV-Well Rounded

News, Notices, and More

Three Reasons to Get Well-Involved

There are many benefits to volunteering with CV-Well. We've summarized the key three here:

1. **It builds your resume.** Leadership roles can help fill gaps in your professional experience and demonstrate to hiring managers and recruiters that you take the initiative to be an industry leader.
2. **It provides networking.** Volunteering is a great way to meet new people in your specialty and expand your network. The lasting personal and professional relationships you develop can lead to career opportunities and broaden your support network.
3. **It develops leadership skills.** CV-Well provides leadership development training through orientation, webinars, online resources, peer-to-peer guidance, and the Leadership Institute. Trainings cover time management, communication, decision making, team building, and strategic planning.

The more you volunteer, the more benefits you'll experience. But this doesn't require long-term or time-consuming commitments. Subject matter experts can build their networks by providing education-related content, such as in webinar development and presentations, article writing, or blog posts. Students can sign up as mentees or for smaller project-based opportunities. Active members looking for more long-term roles can volunteer for leadership positions, from one to two-year commitments. Click [here](#) to view open volunteer opportunities posted on the CV-Well website. Members who don't see what they are looking for can email CV-Well at cvwell@eatright.org to find the right match.

Don't Forget These Member Benefits on Our Website!

The [CV-Well website](#) offers member-only access to all past issues of *Pathways*, as well as free access to the [Natural Medicines Database](#). This resource provides unbiased, evidence-based, clinical information on complementary, alternative, and integrative therapies and access to the [EBSCO Database](#), which contains more than 10,000 journals and magazines with a wide array of content on nutrition, well-being, etc.

CV Reimbursement Trends and Efforts

If you're interested in becoming involved in our efforts to increase awareness of reimbursement issues and topics, contact Carol Bradley at carol.bradleyrd@yahoo.com.

We Welcome Your Input!

Do you have an idea for a CV-Well webinar or *Pathways* article? If so, please email us at cvwell@eatright.org.

Upcoming CV-Well & Academy Events and Webinars

February 22, 2023 (7-8:00 pm)

Join your peers for the **CV Well Read Book Club** discussion on the book, *Inflamed: Deep Medicine and the Anatomy of Injustice* by Rupa Marya and Raj Patel. **Register here!**

October 7-10, 2023

Mark your calendars and plan to attend **FNCE® 2023**, in Denver, CO. Stay tuned for more information.



CV-Well Seasoned

Recipes from Your Colleagues

Creamy Citrus Avocado Pasta

Recipe by Claire Tibboles, Dietetic Intern and Graduate Assistant, Bowling Green State University

This winter, you'll want to try this fresh yet comforting creamy avocado pasta. The recipe is especially adaptable, as you can use any type of pasta from whole grain to legume varieties, and you're free to add your favorite vegetables, proteins, cheeses, or herbs. Additionally, avocados are a great source of monounsaturated fats, supporting cardiovascular health.

Total time: 30 minutes

Serving size: 1 cup

Serves: About 6



Ingredients

- 12 oz dry pasta (I used mini penne)
- 1 Tbsp olive oil
- ½ cup white or yellow onion, roughly chopped
- 2 cloves fresh garlic, roughly chopped
- 2 medium avocados (ripe and pitted) or 2/3 cup mashed
- ½ cup baby spinach, packed
- 1 tsp dried oregano leaves
- Juice of 1 lemon (about 3 Tbsp)
- 1/3 cup water
- 1/8 tsp salt
- 1/8 tsp ground black pepper

Directions

1. Cook pasta according to instructions on box; strain but do not rinse.
2. While pasta is cooking, heat olive oil in a small skillet on medium heat. Add chopped onions and cook for about 3-5 minutes until soft. Add chopped garlic and cook for 1-2 more minutes. Turn off heat and set aside.
3. Scrape avocados into a blender or food processor. Add cooked onion and garlic, spinach, oregano, lemon juice, water, salt, and pepper into blender. Blend until smooth and creamy.
4. Combine "sauce" with cooked pasta.
5. Optional: add proteins, vegetables, olives, cheese, or fresh herbs to your liking—I added tomatoes and parmesan. Best served fresh. Enjoy!

Nutrition Facts

Per serving (1 cup): 270 calories, 7g total fat (4g MUFA), 8g protein, 45g carbohydrate, 55mg sodium