

Chocolate and Cardiovascular Health

by Monica Bearden, RD

Reducing the risk of cardiovascular disease for both men and women continues to be one of the primary public health goals in developed countries. According to the American Heart Association, more than 50% of the deaths in the United States annually are a direct result of clogged arteries leading to heart attacks and strokes. More than twice as many people will die from heart and other vascular diseases than cancer. For this reason, scientists are eager to fully understand and affect the mechanisms contributing to heart disease. Research has revealed that food and many of its components play an important role in protecting and supporting our cardiovascular system.

Flavonoids, which are nearly ubiquitous in the plant kingdom, have come under study for their potential role in heart health. Through advances in analytical chemistry, researchers can now identify and separate

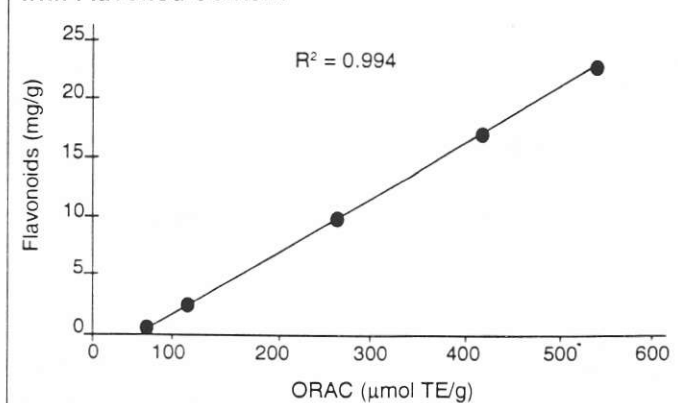
food components to elucidate their contribution to optimal health and disease prevention. Recently, a new method was developed that enables researchers to identify and quantify oligomeric flavonoids (consisting of several flavonoid units) in a wide variety of foods.¹

This advance is important, because previously chemists could only identify and separate smaller flavonoids or the monomeric compounds, leading to a gross underestimation of the flavonoid content in foods containing the larger compounds. For example, this new method enables researchers to identify chocolate as having a bounty of oligomeric compounds. In fact, it is rare for a food item to have such an abundance of these large compounds.

Chocolate's Oligomeric Compounds

The oligomeric compounds may provide health benefits beyond those of the heavily studied monomeric

Figure 2. Antioxidant Potential of Chocolate Coorelated with Flavonod Content¹



compounds found in tea and wine.² Current research shows that chocolate flavonoids are potent antioxidants and suggests they may also contribute to optimal health in other ways.

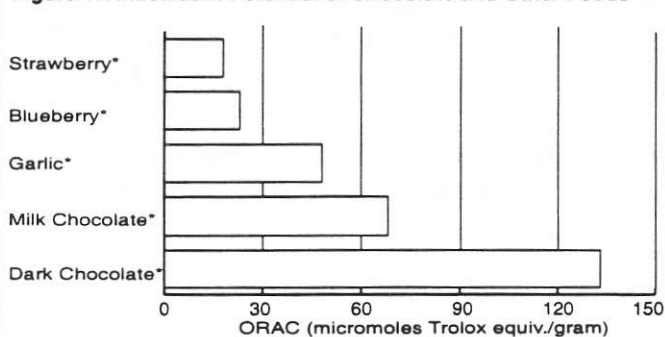
The mechanism by which chocolate flavonoids provide antioxidant protection can be explained by their phenolic structure and number of hydroxyl groups. These physical characteristics make the flavonoids potent antioxidants. This has been confirmed by the recently published Oxygen Radical Absorbance Capacity (ORAC) data, which identified chocolate and cocoa as having potent antioxidant potential (Figure 1) and correlated the results with the flavonoid content (Figure 2).¹ In these figures, the antioxidant capacity of foods is expressed in Trolox equivalents per gram (TE/g), a vitamin E analog against which foods are compared.

It has also been reported that the consumption of delipidated cocoa protected low-density lipoprotein

(LDL) from oxidation *ex vivo*.³ These results were similar to an earlier *in vitro* study in which the phenols of chocolate were extracted and shown to decrease the oxidation of LDL.⁴ Oxidation of LDL has been identified as a potential contributor to the progression of atherosclerosis.

Additionally, platelet adhesion and aggregation have been reported to play a role in the development of plaque formation and cardiovascular disease. Recently, a well-controlled pilot clinical study suggested that the flavonoids in chocolate modulate pathways that lead to platelet adhesion and aggregation.⁵ Researchers at the University of California, Davis administered a high cocoa polyphenol beverage to healthy, non-smoking volunteers. Blood was taken at baseline and at 2 hours and 6 hours post-consumption. Results showed that cocoa consumption prolonged the time for primary hemostasis (blood clotting), and decreased markers of platelet activation

Figure 1. Antioxidant Potential of Chocolate and Other Foods



*as consumed

Sources:

Prior, et al. *J Ag Food Chem.* 1998;46:2686-2693.

Wang, et al. *J Ag Food Chem.* 1996;44:701-705.

Cao, et al. *J Ag Food Chem.* 1996;44:3426-3431.

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and microparticle formation *ex vivo*.

Thus, the cocoa beverage decreased markers associated with aggregation and adhesion and significantly increased the time it took for *ex vivo* stimulated blood to clot. These results are very promising and warrant further investigation.

As research findings on the health benefits of foods begin to unfold, it may come as a pleasant surprise to many people that chocolate can be incorporated into a heart-healthy diet. ■

References

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3. Kondo K, Hirano R, Matsumoto A. Inhibition of LDL oxidation by cocoa. *Lancet*. 1996; 348:1514.
4. Waterhouse A, Shirley R, Donovan J. Antioxidants in chocolate. *Lancet* 1996; 348:834.
5. Wang JF, Schramm DD, Holt RR, et al. Dose-response effect from chocolate consumption on plasma epicatechin and oxidative damage. *J Nutr* (in press).

Monica Bearden is nutritionist/assistant external communications manager at M&M Mars.



CHAIR'S MESSAGE

Exciting Times Ahead for SCAN Members

Exciting times are ahead for nutrition professionals. A committee of the National Academy of Sciences' Institute of Medicine recently recommended that nutrition therapy be a reimbursable benefit. The Medical Nutrition Therapy bill now has majority cosponsorship in the House of Representatives. And the ADA survey, "Nutrition and You: Trends 2000," shows that a majority of Americans are aware of RDs and DTRs. What does this mean for SCAN members? To me, it means opportunities for making a profound impact in your workplace, your communities, and in industry. Last August, then SCAN chair Rita Johnson led the Executive Committee in defining a three-year plan for SCAN. As we work from this plan, we advance an important goal: To be a key player in our four practice areas. This year, we plan to increase our focus on three activities: strengthening industry relations, developing practice guidelines in our four practice areas, and expanding volunteer involvement.

In industry relations, my vision is that SCAN members are tapped as integral sources of information. Through the leadership of our development director, Kerry Neville, SCAN has secured strong alliances with industry. You will have an opportunity to meet some of our industry liaisons at the ADA annual meeting in Denver in October.

Because SCAN members are knowledgeable leaders, I see them as the experts in developing practice guidelines for each of our practice areas. SCAN's TRAC committees (Technical Resource Advisory Committees) are the vehicle for achieving this goal. I encourage those of you with expertise in practice guidelines to contact the SCAN office or contact a TRAC Chair directly.

Finally, our members are SCAN's greatest asset and volunteerism is our lifeblood. We are the largest practice group and possess a wealth of knowledge, energy, and expertise. I urge you to complete a "Willingness to Serve" form by contacting the SCAN Office. You can contribute your talents to such activities as the 2001 SCAN Symposium, workshops, industry relations, SCAN's Web site, and SCAN'S PULSE.

What's ahead for SCAN in the coming year? We have numerous activities planned. SCAN's Symposium, scheduled for April 2001 in Washington, DC, will be an event not to miss. The Symposium will focus on exercise and nutrition in relation to all four of SCAN's areas of practice: sports, wellness, cardiovascular health, and disordered eating. SCAN workshops will continue, with two slated for the months ahead. As usual, SCAN'S PULSE will cover important scientific and educational topics to keep your knowledge current, and Quick SCAN will keep you posted on your association. Make sure the SCAN Office has your fax number to receive the quarterly Quick SCAN. And check out SCAN's Web site and our two listserves on disordered eating and sports nutrition.

Remember: SCAN is just a call or click away. Call us at 719/475-7751, e-mail us at SCAN@fleckcorporation.com, and visit us at www.nutrifit.org. Have a terrific summer and I look forward to working with you in the new SCAN millennium. ■

Kristine Bradsher, MBA, RD, Chair