

by Linda Milo Ohr

Strengthening the Heart

The American Heart Association (AHA) in 2011 set a goal for America to improve the cardiovascular health of all Americans by 20% and to reduce deaths from cardiovascular diseases and stroke by 20% by 2020. Improving diets will be the key to reaching this goal. Today, more products are hitting market shelves that help promote heart health, affecting blood pressure, cholesterol, or overall cardiovascular health.

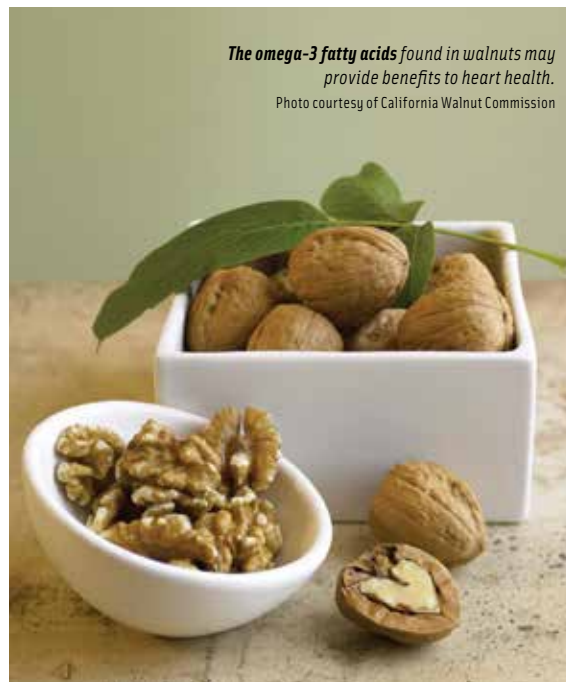
For more than 15 years, the AHA has helped consumers find heart-healthy foods and beverages with its Heart-Check program. Food companies can certify products to use the red-and-white Heart-Check mark. According to the AHA, research shows consumers are more likely to buy a product bearing the symbol. The organization in 2011 expanded and improved the Heart-Check Food Certification Program, allowing certification of more foods with healthier fats, including fish, nuts, and other foods higher in monounsaturated and polyunsaturated fats. The AHA also revised its sodium allowances and implemented screening guidelines to limit added sugars and promote dietary fiber in certified products.

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resources to create heart-healthy products consumers are looking for. Here is a look at some of the options.

significantly lower in the subjects who consumed dried apple compared with those who consumed the dried plum. The subjects who consumed dried apple had significantly lower serum levels of total cholesterol and low-density lipoprotein (LDL) cholesterol by 9% and 16%, respectively, at three months compared with baseline.

- **Potatoes.** Vinson et al. (2012) showed that purple potatoes were an effective hypotensive agent. The potatoes contain high concentrations of antioxidants, including anthocyanins and carotenoids. In a crossover study, 18 hypertensive subjects with an average BMI of 29 were given either 6–8 purple potatoes twice daily or no potatoes for 4 weeks and then given the other regimen for another 4 weeks. There was no



The omega-3 fatty acids found in walnuts may provide benefits to heart health.

Photo courtesy of California Walnut Commission

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Whole Foods

- **Apples.** Chai et al. (2012) demonstrated that 75 g of dried apple (about two medium-sized apples) significantly lowered atherogenic cholesterol levels as early as 3 months in postmenopausal women. The researchers randomly assigned 160 female subjects to one of two groups: dried apple (75 g/day) or dried plum (comparative control). At six months, serum total cholesterol levels were

significant body weight increase, and diastolic blood pressure decreased 4.3% while systolic blood pressure decreased 3.5%.

- **Grapes.** Vislocky and Fernandez (2012) suggested that red/purple grapes and grape products can help support a healthy heart. The review study concluded that consuming red/purple grapes and grape juice, including Concord grape juice, each day can support cardiovascular health by having a favorable impact on vascular health, LDL oxidation, blood lipids, oxidative stress, and inflammation (Welch's, 2012).

- **Raisins.** "Raisins deliver dietary fiber and

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Plant sterols like those formulated in Smart Balance milk have been shown in research studies to have cholesterol-lowering abilities.

Photo courtesy of Smart Balance



beneficial nutrients like potassium and antioxidants associated with cardio-protective benefits such as reduced blood pressure," said James Painter, Nutrition Research advisor for the California Raisin Marketing Board, Fresno, Calif. (phone 559-248-0287, www.loveyourraisins.com), and a registered dietitian. Research presented at the American College of Cardiology's Scientific Session in March 2012 suggested that eating raisins three times a day may significantly lower blood pressure among individuals with slightly higher than normal blood pressure. The study included 46 male and female subjects with prehypertension. The subjects were randomly assigned to snack on raisins or pre-packaged commercial snacks that did not contain raisins or other fruits or vegetables three times a day for 12 weeks. Data analyses revealed that compared to other popular snacks, raisins significantly reduced systolic blood pressure at weeks four, eight, and 12. The results also showed that raisins significantly reduced mean diastolic blood pressure at all study visits, with changes ranging from -2.4 to -5.2 mmHg.

Painter suggests that the beneficial effect on blood pressure may be due to the high potassium and low

sodium contents of raisins, compared to pre-packaged snacks. Raisins also contain soluble fiber and antioxidants, which contribute to their effect on reducing both LDL cholesterol and LDL oxidation. Current research is looking at the effect of raisins on blood pressure and cholesterol in diabetic subjects, said Painter.

Nuts

• **Almonds.** Almonds provide 13 g of unsaturated fat/ounce and 1 g of saturated fat, and they are naturally cholesterol-free. Almonds also deliver protein (6 g), fiber (3.5 g), calcium (75 mg), vitamin E (7.4 mg), riboflavin (0.3 mg), and niacin (1 mg), all of which contribute to a healthy heart. One ounce of almonds meets 35% of the daily required value of vitamin E. The results from nine clinical studies conducted in the past 17 years show the beneficial impact almonds have on cholesterol, and even influenced the very first qualified health claim for nuts, linking them to a reduced risk of heart disease.

• **Walnuts.** Walnuts are a rich source of protein, polyunsaturated fats, vitamins, minerals, fiber, antioxidants, and omega-3 fatty acids. Ma

et al. (2010) showed that eating 2 oz of walnuts/day as part of a normal diet may improve cardiovascular health in people with type 2 diabetes. The researchers randomly assigned 24 subjects with type 2 diabetes to either receive an ad libitum diet enriched with 56 g of walnuts/day or an ad libitum diet without walnuts for eight weeks. Endothelial function significantly improved after consumption of a walnut-enriched ad libitum diet, suggesting a potential reduction in overall cardiac risk.

• **Pistachios.** Baer et al. (2012) showed that after eating pistachios, LDL cholesterol levels were lowered. In the crossover feeding study, 16 subjects consumed pistachios for three weeks as part of a controlled diet. The doses of pistachios were 0, 42, and 84 g/day. The pistachio nut intervention lowered LDL-cholesterol by 6%, but did not significantly change plasma total cholesterol, HDL cholesterol, or triacylglycerols.

• **Pecans.** Nearly 60% of the fats in pecans are monounsaturated and another 30% are polyunsaturated, leaving very little saturated fat in pecans. Hudthagosol et al. (2011) showed that after eating pecans, gamma-tocopherol levels in the body doubled and unhealthy oxidation of LDL cholesterol in the blood decreased by as much as 33%. For the study, 16 male and female subjects ate a sequence of three diets composed of whole pecans, pecans blended with water, or a control meal of equivalent nutrient composition. The pecan meals contained about 3 oz of the nut. In the subjects who consumed the whole-pecan meal, oxidized LDL cholesterol decreased by 30% after two hours, 33% after three hours, and 26% after eight hours.

Beta-glucans

• **Barley.** Cargill, Minneapolis, Minn. (phone 800-227-4455, www.cargill.com, www.barliv.com), in January 2012 received approval from Health Canada for use of its *Barliv*™ barley betafiber as a novel dietary fiber in

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Canada. The ingredient is a soluble fiber extract derived from whole-grain barley, and it has been clinically shown to lower cholesterol. In both the U.S. and Europe, qualified products made with *Barliv* can carry a health claim stating that they reduce the risk of coronary heart disease.

- **Oat.** Wolever et al. (2010) showed that 3 g of

bioactive beta-glucan from *OatWell*® oat bran/day is effective at significantly lowering LDL-cholesterol levels. CreaNutrition AG, Zug, Switzerland (phone +41-41-7470-199, www.creanutrition-sof.com, www.oatwell.com), offers the ingredient. The subjects consumed two servings of *OatWell* cereal/day for four weeks and had a 5.5% average decrease in their LDL-cholesterol levels. The extrusion process used to make *OatWell* cereals makes the beta-glucan more soluble and, as a result, produces higher viscosity in the gut.

Oils

- **Canola oil.** "There shouldn't be anybody in America who doesn't have a bottle of olive oil and canola oil in their kitchens," said Mehmet Oz in his television show, "Dr. Oz Show," earlier in 2012. Canola oil was featured as one of the five essential, healthy cooking oils (those high in monounsaturated fat and low in saturated fat) to have at home. Canola oil is high in omega-3 alpha-linolenic acid, an essential fatty acid, with 2 g for every 10 mL of oil. Canola oil is also a rich source of omega-9 and moderate source of omega-6 fatty acids. When canola oil displaces saturated fat in the diet, studies show it decreases total and LDL cholesterol. The U.S. Food and Drug Administration authorized a qualified health claim on canola oil's ability to reduce the risk of heart disease when used in place of saturated fat, according to CanolaInfo, Winnipeg, Manitoba (phone 866-479-0853, www.canolainfo.org).

- **Olive oil.** Widmer et al. (2012) showed that olive oil improved endothelial function in patients with early atherosclerosis. The aim of the study was to compare the effect that a daily intake of 30 mL of simple olive oil and 30 mL of epigallocatechin 3-gallate (EGCG)-supplemented olive oil had on endothelial function as well as on inflammation and oxidative stress after a period of four months. After four months, when the subject groups taking olive oil and EGCG-supplemented olive oil were combined, the results showed that olive oil significantly improved endothelial function. There were no significant differences in results between the two olive oil groups. However, with olive oil supplementation, there was a significant reduction in inflammatory parameters.

- **Krill oil.** Fosshaug et al. (2011) demonstrated the beneficial effects of krill oil supplementation on heart function in an experimental model of heart failure. Pre-treatment with *Superba*™ krill oil from Aker BioMarine, Oslo, Norway (phone +47-24-13-0000, www.akerbiomarine.com), attenuated left ventricular dilatation and hypertrophy after myocardial infarction (MI). Rats were randomized to

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Pecans contain low levels of saturated fat. The monounsaturated and polyunsaturated fats that make up the bulk of the fat content may help to reduce levels of LDL cholesterol.

Photo courtesy of Georgia Pecan Commission

pre-treatment with krill oil or control feed 14 days before induction of MI. The rats were examined with echocardiography at seven days post-MI, and those in the control group were further randomized to continued control feed or krill oil feed for seven weeks. The rats that were pre-treated with krill oil showed significant attenuation of left ventricular dilatation, heart weight, and lung weight, as compared to those in the placebo group. *Superba* krill oil is a pure, natural source of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), and the naturally occurring antioxidant astaxanthin. The uniqueness is that the majority of the omega-3 fatty acids are provided in phospholipid form.

Plant Sterols

"Recent research continues to reinforce the role of sterols on significant lowering of LDL levels in the blood," said Steve O'Brien, Product Manager, ADM Natural Health & Nutrition, Decatur, Ill. (phone 800-637-5843, www.adm.com). Casas-Agustench et al. (2012) showed that consumption of 2 g of plant sterols/day as part of either skimmed milk or semi-skimmed milk containing vegetable fat lowered LDL cholesterol in hypercholesterolemic subjects. "ADM has worked to achieve GRAS approval on *CardioAid*™ sterols from the FDA for use in 19 food categories in the

United States, the widest array of product applications in the industry, including everything from cereals to soup to pasta," said O'Brien.

"Additionally, Canada has recently approved sterols like *CardioAid* for use in a variety of food applications such as margarines and dairy applications." ADM recently launched *CardioAid* SWD, a water-dispersible sterol primarily designed for use in neutral-pH beverages.

The cholesterol-lowering abilities of plant sterols are showcased in a variety of products. For example, Cargill's *CoroWise*® plant sterols (www.corowise.com) are currently used in *Smart Balance*® *HeartRight*® *Fat Free Milk*, which supplies 0.4 g of *CoroWise* plant sterols/serving, 25% more calcium and protein than whole milk, DHA/EPA omega-3 fatty acids, and vitamin D. Corazonas Foods also uses *CoroWise* plant sterols in its tortilla chips, potato chips, and oat-meal squares.

Novel Extracts

• **Tomato concentrate.** *Fruitflow*® from DSM Nutritional Products, Parsippany, N.J. (phone 800-526-0189, www.unlimitednutrition-na.dsm.com, www.dsmnutritionalproducts.com), contributes to healthy blood flow. In eight human trials, consumption of *Fruitflow* has proven to maintain healthy platelet aggregation and improve blood flow. The ingredient is a water-soluble, tomato-based concentrate developed in either a water-soluble syrup or a sugar-free derivative supplied in powder format. They are prepared from tomato extract using patented processes and are standardized on three bioactive fractions.

• **Olive extract.** An olive extract, *Hytolive*®, from PL Thomas, Morristown, N.J. (phone 973-984-0900, www.plthomas.com), has a high concentration of natural hydroxytyrosol, a major phenolic compound found in olives that provides a great part of the health benefits of both olive fruit and virgin olive oil. A dosage of 100 mg of

Hytolive powder contains the hydroxytyrosol equivalent to 10 table olives or 1/2 L of extra virgin olive oil. In 2011, the European Foods Safety Authority concluded that a cause-and-effect relationship had been established between the consumption of hydroxytyrosol and related compounds from olives and olive oil and protection of blood lipids from oxidative damage.

Frutarom USA, North Bergen, N.J. (phone 201-861-9500, www.frutarom.com), in October 2011 launched *Benolea*®, an olive leaf extract that supports cardiovascular health. The ingredient's blood pressure-lowering capacity exerts a positive influence on blood lipids and helps manage blood-sugar levels. It acts as a highly powerful antioxidant and protects blood vessels against cellular damage caused by free radicals.

• **Cocoa extract.** Cocoa flavanols are a unique blend of phytonutrients found in the cocoa bean and are present in *CocoaVia*® cocoa extract supplement from Mars Botanical, Gaithersburg, Md. (www.cocovia.com, www.marsbotanical.com). Numerous studies have demonstrated that cocoa flavanols can help keep blood vessels healthy and support healthy circulation. Cocoa flavanols help maintain healthy levels of nitric oxide, and by doing this, work to maintain the flow of oxygen and nutrients. One of the many things that nitric oxide does is to trigger the relaxation of the vessel in response to changes in blood flow.

Proteins

Soy protein has been linked to providing benefits to cardiovascular health. Dairy proteins such as whey protein are garnering more attention with their effects on hypertension. He et al. (2011) indicated that both soy and milk protein intake reduced systolic blood pressure compared with a high-glycemic-index refined carbohydrate among patients with prehypertension and stage 1 hypertension.

The randomized, double-blind crossover trial with three intervention phases included 352 adult subjects with prehypertension or stage 1 hypertension. The subjects were assigned to take 40 g of soy protein, milk protein, or carbohydrate (control) every day for eight weeks in a random order. Soy protein and milk protein supplementations were significantly associated with reductions in systolic BP. There was no significant

difference in the BP reductions achieved between soy or milk protein supplementation. **FT**



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