Wild Blueberries and Cardiovascular Health

Cardiovascular disease (CVD) leading to heart attack (myocardial infarction) and stroke are major contributors to cause-of-death statistics in most developed countries including Canada (Manuel et al., 2003).

CVD involves the build-up of plaque on the walls of blood vessels (atherosclerosis) which interferes with normal blood vessel function and the delivery of oxygen. CVD risk factors include hypertension (high blood pressure), diabetes mellitus type 2, lipid metabolic diseases (high cholesterol and triglycerides) and excess weight or obesity. CVD risk is exacerbated by an unhealthy diet and sedentary lifestyle.

Hypertension, type 2 diabetes, and obesity incidence all increased significantly in Canada in a study that examined the period between 1994 and 2005 (Lee et al., 2009).

However, CVD risk can be reduced by consuming a balanced diet that includes certain foods, notably deeply-coloured berries like blueberries. Scientific consensus is emerging that the consumption of berry pigments benefits heart health.

The deep blue, red and purple coloration of berries is conferred by anthocyanin pigments (antho = plant; cyanin=blue). Compared to other popular fruits, blueberries are extremely rich in anthocyanin pigments. Anthocyanins belong to the group of plant compounds called flavonoids. Many flavonoids, including anthocyanins, are associated with health benefits.

A reduced risk of CVD-related death has been concluded based on human population studies that determine CVD death risk in relation to reported anthocyanin intake (Grosso et al., 2017). In these studies, anthocyanin intake is estimated based on reported intake of blueberries and strawberries, and sometimes also red wine and red-peeled apples. In a meta-analysis of 14 eligible prospective cohort studies a reduced risk of CVD incidence was associated with anthocyanin intake (Wang, Ouyang, Liu, & Zhao, 2014). In three cohort studies examining CVD risk, higher anthocyanin intake was associated with an approximately 25% reduced risk of coronary heart disease risk (Cassidy et al., 2016; Goetz et al., 2016).

Blueberry compounds protect and improve the condition of blood vessels, which is needed for proper vascular performance. Vascular stiffness is a biomarker of atherosclerosis and reduced vascular performance. In a clinical study of vascular function, arterial stiffness, which was assessed using flow-mediated dilation, was improved after ingestion of a single dose of wild blueberry juice (Rodriguez-Mateos et al., 2013).

Lower arterial stiffness which was measured clinically using pulse wave velocity (PWV) was associated with a higher anthocyanin intake in a population study of women (Jennings et al., 2012). In an 8-week placebo-controlled study of postmenopausal women with pre- and stage-1 hypertension, greater blueberry intake was associated with beneficial effects on arterial stiffness (using PWV) (Johnson et al., 2015). In a 6-week placebo-controlled study of men and women with metbolic syndrome, blueberry intake was associated with improvements in resting vascular endothelial function (Stull et al., 2015).

Blueberry intake for 8 weeks was associated with reduced blood pressure (BP) and lower levels of low density lipoprotein (LDL) in obese women and men already suffering from metabolic syndrome (Basu et al. 2010). Systolic and diastolic blood pressure in women with pre- and stage 1- hypertension was 5 to 6% lower in those consuming blueberries versus placebo (Johnson et al., 2015). Daily bilberry consumption was asssociated with a reduced systoic BP in a placebo-controlled study (Erlund et al., 2008). Notably not all studies find an effect of blueberry intake on blood pressure pressure (Basu et al., 2010; McAnulty et al., 2014; Stull et al., 2015).

Anthocyanin intake was associated with improvements in LDL, high density lipoprotein (HDL), triglycerides and adiponectin, in a placebo-controlled study of 58 diabetic patients (Li et al., 2015). Individuals (n=150) with high cholesterol who consumed anthocyanin for 12 weeks had improved LDL, HDL and improved endothelial function (Yanna Zhu et al., 2011). In the same 150 hypercholesterolemic patients, circulating biomarkers of whole-body inflammation, were lower after 24 weeks of anthocyanin intake (Y Zhu et al., 2013).

Blueberries and their anthocyanin pigments appear to support cardiovascular health via multiple mechanisms (Cutler, Petersen, & Anandh Babu, 2017). Their beneficial impact on biomarkers of cardiovascular health (e.g. blood pressure, plasma lipids and triglycerides, vascular stiffness) has been clinically demonstrated in diverse and at-risk human populations. These outcomes are supported by mechanistic evidence obtained from in vitro and in vivo studies. This breadth of research evidence helps to illustrate the potential value of wild blueberries in cardiovascular health and in the reduction of CVD risk.

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About the Wild Blueberry Association of North America

The Wild Blueberry Association of North America (WBANA) is an international trade association of growers and processors of wild blueberries from Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Maine, dedicated to bringing the wild blueberry health story and unique wild advantages to consumers and the trade worldwide. For news, recipes, and related health information about wild blueberries visit www.wildblueberryassociation.ca or www.wildblueberries.com. For the latest updates, read the blog. Visit on Facebook, Twitter, or Instagram.

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For more information, recipes, visuals or to schedule an interview or in-studio segment, please contact Sally Matteo or Susan Willemsen at The Siren Group Inc. Tel: 416-461-5270. E-mail: sally@thesirengroup.com or susan@thesirengoup.com. Visit: www.thesirengroup.com or on Twitter and Instagram @thesirengroup.