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BerryCare: Protection from Pollution with Phytonutrient-Rich Berries

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Pollution is the presence of contaminants in our environment. Pollution can be found in air, water, soil, and food. These contaminants tend to have negative effects on the environment and on health. Some contaminants may have more obvious effects than others. Pollution increases compounds called free radicals in the body. Too many free radicals in the body cause oxidative stress. Oxidative stress can increase the risk for cancer and other chronic diseases because cells are damaged more easily and do not repair themselves as well.

Pollution – Man-made and naturally formed chemicals that stay in the air, water, and soil, and are bad for human health.

There are many sources of pollution in our world. Some are more obvious than others, such as oil spills that make national news.

We are exposed to pollution every day.

Air: care exhaust, tobacco smoke, and chemicals like polychlorinated biphenyls (PCBs)

Water: pipes, arsenic, PCBs

Food: pesticides, arsenic, mercury

Food storage: Chemicals in plastic containers, bisphenol A (BPA)

Additionally, our immune system mounts an attack against pollutants in order to protect our bodies, much like fighting the flu or common cold. Inflammation is the name for the process of our immune system protecting us from pollutants. Too much inflammation can be bad because it can lead to cell damage and the development of chronic disease through the generation of free radicals and oxidative stress.

Pollution in the environment cannot always be avoided. However, eating for good health may help reduce the effects of pollution in the body. Choosing more nutritious foods, such as those high in phytonutrients, may reduce cell damage and protect the body from the negative health effects of pollution.

Phytonutrients are naturally found in fruits, vegetables, whole grains, legumes, and nuts. The different colors of fruits and vegetables are due to

the phytonutrients present in the plant. "Phyto" means plants, and "nutrients" are found in all foods and help support our health.

One simple way to help protect yourself from pollution is to consume a diet high in phytonutrients because they can help decrease inflammation and oxidation. Decreasing these can help protect against the development of a wide range of health conditions, such as cancer and heart disease.

Learn more about the health benefits of phytonutrients commonly found in fruits and vegetables and how they protect the body from environmental pollution by reading FCS 3-598 publication *Body Balance: Protect Your Body from Pollution with a Healthy Lifestyle—Make Your Plate a Rainbow.*

Phytonutrients – Substances naturally made by plants that protect us and help prevent disease.

Table 1. Phytonutrients found in blackberries, blueberries, strawberries, and raspberries.

Phytonutrient	Potential health benefits
Flavonoids	Protect against cancer; anti-inflammatory properties; protect against heart disease
Flavonols	Anti-inflammatory; may help control blood sugar
Anthocyanins	Heart healthy; protect against cancer; anti-inflammatory properties
Cyanidin	Protects your skin; protects against diabetes; helps prevent weight gain
Proanthocyanidins	Reduce the risk of heart disease and cancer; protect against UTIs
Ellagic Acid	Protects against cancer, protects against heart disease

Eating plain fruit can curb those cravings for a sweet treat and is a healthy alternative to eating baked goods, candy, cookies and pastries. Berries including blackberries, raspberries, strawberries and blueberries, are all very rich source of phytonutrients.

One serving of raw blackberries is equal to a half-cup. Try to eat one serving of blackberries as often as possible. You will experience the health benefits from fresh or frozen blackberries. Eat them raw or in recipes with limited amounts of added sugar and fat.

Additionally, blackberries are the state fruit of Kentucky. They grow well all over Kentucky, and if properly cared for, a single plant can bear

fruit for 12 or more years. Once they are planted, blackberries are relatively low maintenance and easy to take care of. Depending on the type of blackberry plant, one plant can make up to 3 pounds of berries. The weather and where the plants grow will affect how many berries will be harvested.

Strawberries, blueberries, and raspberries are also rich in similar phytonutrients and might be good options to grow instead of or along with blackberries. Whether you grow them or buy them, eat a variety of berries year around in fresh, frozen or canned forms. Berries tend to be cheaper when they are in season and can be preserved by freezing. Be sure to check the food label of any frozen or canned berries to select no-added or low-sugar products. Good nutrition is one of our best defenses for staying healthy, even in the presence of environmental pollutants.

Did you know that being physically active can also help decrease harmful inflammation and oxidative stress caused by a variety of reasons including pollutants? Physical activity includes a wide range of exercises. The most important aspect of choosing a type of physical activity is to remember that it should be fun. Taking care of a garden, or a row of blackberry plants, can be a great way to be physically active. Get family and friends involved, listen to music, or join a team—just make sure you're enjoying yourself as you get your heart rate up. Aim for thirty minutes of moderate-level physical activity, five days per week.

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Reference

American Institute for Cancer Research (2016). Phytochemicals: The Cancer Fighters in the Foods We Eat. Accessed September 27, 2016 at: http://www.aicr.org/reduce-your-cancer-risk/diet/elements_phytochemicals.html?referrer=https://www.google.com/.

Center for Disease Control (CDC) (2015). How Much Physical Activity Do Older Adults Need? Accessed September 23, 2016 at: https://www.cdc.gov/physicalactivity/basics/older_adults/.

Cooperative Extension Service. Brewer, D., Bellamy, H., Gaetke, L. (2016). Body Balance: Protect Your Body from Pollution with a Healthy Lifestyle.

Produce For Better Health Foundation (PBH) (2012). What Are Phytonutrients? Accessed September 27, 2016, at: http://www.fruitsandveggiesmorematters.org/what-are-phytochemicals.

Wisconsin Department of Health Services (2016). Polychlorinated Biphenyls (PCBs) and Your Health. Accessed September 27, 2016 at: https://www.dhs.wisconsin.gov/environmental/pcb-fish.htm.

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