



# ARBOR FARMS MARKET

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## Our February 2019 Newsletter for Healthy Living

### Give Yourself a Boost

If you struggle with high blood pressure and/or less than ideal heart health, you'd be wise to tweak your diet to include more nitrate-rich foods. The devil's in the details, though; it's important to remember that not all dietary nitrates have the same beneficial influence. But while plant-based nitrates confer a number of health benefits, meat-based nitrates are known to be carcinogenic.

The reason for this differentiation has to do with how nitrates are processed in your body, based on cofactors found in their source. Dietary nitrates are converted into nitrites by oral bacteria during chewing. Once the nitrites are swallowed and come into contact with stomach acid, they can be converted into either beneficial nitric oxide or carcinogenic N-nitroso compounds such as nitrosamines. Several factors can influence this conversion: whether or not the nitrites are found in combination with



protein and heme (an iron-containing compound that makes up part of the hemoglobin molecule in blood). This is what makes conventional processed meats so detrimental to your health.

Plants contain antioxidants (such as vitamin C and polyphenols) that impede the formation of harmful nitrosamines. The presence of these compounds help to ensure that the nitrites are converted into beneficial nitric oxide once they reach your stomach rather than

harmful N-nitroso compounds. The composition of your gut bacteria may also play a role. Research suggests beneficial bacteria help break down nitrosamines, while bad gut bacteria increase nitrosamine production.

Nitric oxide is a soluble gas continually produced from the amino acid L-arginine inside your cells. While nitric oxide is a free radical, it's also an

helps reverse metabolic syndrome and has antidiabetic effects; helps improve your physical fitness — for example, raw beets have been shown to boost stamina during exercise by as much as 16 percent as a result of the increase in nitric oxide production.

Research confirms you can boost your body's nitric oxide production by eating nitrate-rich plant foods,

***“Nitric oxide... boosts your immune function and has powerful antibacterial potential.”***

important biological signaling molecule that supports normal endothelial function and protects your mitochondria — the little "power stations" in your cells that produce a majority of your body's energy in the form of ATP. It's a potent vasodilator, helping relax and widen the diameter of your blood vessels, and healthy blood flow allows for efficient oxygenation of tissues and organs, and aids in the removal of waste and carbon dioxide. Importantly, nitric oxide infuses into areas that are hypoxic, meaning in need of oxygen, and both your heart and brain are heavy oxygen users.

Nitric oxide also: boosts your immune function, making your body better equipped to fight off foreign pathogens; has powerful antibacterial potential; plays an important role in the homeostasis of reactive oxygen species, which can have a significant impact on metabolic pathways; helps suppress inflammation; promotes angiogenesis, the formation of new, healthy blood vessels;

thereby lowering your blood pressure and safeguarding yourself against heart attacks. As noted in the journal Hypertension: *"Adequate nitric oxide production is the first step in a chain reaction that promotes healthy cardiovascular function, while insufficient nitric oxide triggers a cascade of destruction that eventually results in heart disease ... Plus, it prevents red blood cells from sticking together to create dangerous clots and blockages."*

Research shows a glass of beetroot juice can lower blood pressure as well as or better than prescription medication; raw beets have been shown to lower blood pressure by an average of four to five points within a few hours. In one study, drinking 8 ounces of beet juice per day lowered blood pressure by an average of nearly eight points after the first week, which is more than most blood pressure medications. As noted in a systematic review and meta-analysis

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### What's Inside This Issue

- Go Organic for Oranges
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- 2018 Organic Produce CSA— Sign up now!

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## Go Organic for Oranges

Oranges are one of the most popular fruits in the U.S., but be aware that soon you may be sinking your teeth into an orange doused in antibiotics such as streptomycin and oxytetracycline, medications that are medically important to humans. In December 2018, the U.S. Environmental Protection Agency (EPA) approved the “maximum

cumb to citrus greening. “We’re using more of these antibiotics on fruit trees than to treat disease in humans,” Nathan Donley, a senior scientist at the Center for Biological Diversity, said in a news release. “Citrus greening disease is a serious issue, but using important antibiotics with limited effectiveness against the disease isn’t the solution.”

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level” of oxytetracycline for use in citrus fruits — just days after approving residues of the drug on fruit. The drug acts as a pesticide and is intended to suppress citrus greening disease, a devastating plant condition that’s been damaging citrus crops in Florida and other states.

It’s unclear how much of the drugs will migrate to the orange flesh, and what the implications will be for the person who eats them, but on a larger scale it’s clear that spraying antibiotics freely into the environment on this scale is a recipe for disaster. Citrus greening is one of the “most serious citrus plant diseases in the world,” according to the U.S. Department of Agriculture (USDA). It’s spread by the Asian citrus psyllid, which feed on the trees and can infect them with the bacterium *Candidatus Liberibacter asiaticus*, which causes the disease. Trees affected by citrus greening lose the ability to take in nutrients, causing problems with growth, resulting in smaller fruit, sour fruit and fewer fruits. Oranges, for instance, may remain green even when they’re ripe, and the fruit may be misshapen, bitter and hard. Once infected, there’s no cure for citrus greening and most trees die within a few years.

In the U.S., citrus production during the 2017 to 2018 season was expected to fall 24 percent to 3.5 million tons due in part to unfavorable weather, but also because citrus greening disease caused fruit in Florida to drop before it was ripe. Citrus growers are understandably desperately searching for a solution, which landed the trees on antibiotics. Antibiotics provide only a temporary band-aid, however, and won’t cure the disease. Instead, the antibiotics merely keep the trees alive and producing fruit a little bit longer, provided they’re repeatedly sprayed. Ultimately, even the antibiotic-treated trees will suc-

The EPA proposed to expand the use of another antibiotic, streptomycin, to treat citrus greening disease and citrus canker, a bacterial disease that causes lesions on the fruit, leaves and stems along with premature leaf and fruit drop. If approved, the proposal could mean more than 650,000 pounds of streptomycin could be applied to up to 480,000 acres of citrus trees in Florida each year, along with another 23,000 acres of citrus trees in California. The use of both oxytetracycline and streptomycin as pesticides on agricultural plants is banned in the European Union and Brazil, amid rising concerns over antibiotic resistance.

“This short-term agricultural fix is a horrible precedent that ignores the dangerous, long-term implications of overusing these medically important antibiotics,” Donley said. “The more we use these medicines in agriculture, the more likely they’ll lose their effectiveness when people fall desperately ill.” Oxytetracycline, for instance, is commonly used to treat respiratory tract infections such as pneumonia, along with some sexually transmitted infections. Streptomycin is typically used for serious bacterial infections for which other medicines may not work, such as tuberculosis. Antibiotics have been sprayed on fruit orchards for years (streptomycin is registered for use on peaches, pears and apples, for instance), but at levels far lower than those currently approved. The nonprofit group Keep Antibiotics Working estimated that the state of Florida could end up using 36 times more streptomycin and four times more oxytetracycline on citrus trees than are used in Americans in a year.

Steve Roach, food safety program director for the Food Animal Concerns Trust, told National Geographic: “Obviously this is a big problem for the

*citrus industry. But we are really concerned that they are asking to adopt routine antibiotic use, where they will pretty much have to be regularly spraying the whole industry. These are exactly the conditions we have been fighting against in animal agriculture: industry-wide use of antibiotics on a regular basis.”* Agriculture remains a driving force behind the surge in antibiotic-resistant disease, although typically this is talked about in regard to livestock living on concentrated animal feeding operations rather than citrus groves.

According to WHO, use of all classes of medically important antibiotics should be reduced in food-producing animals, while their use for growth promotion and disease prevention without diagnosed illness should be completely



restricted. Allowing their use for widespread spraying on citrus trees, then, appears to contradict WHO’s goals in combating the spread of antibiotic resistant disease. Using antibiotics in another agricultural setting, where other agricultural chemicals are also being used, therefore has the potential to make antibiotic resistance exponentially worse — not to mention being harmful to wildlife and pollinating insects.

Typically, fruits with a thick peel, which you intend to remove before eating, are not the top priority for buying organic. However, it’s unknown whether agricultural antibiotics can be taken into the flesh of the fruit, so it’s better off to choose organic. Even putting the health risks of consuming antibiotic residues aside, choosing organic means you’re not supporting the agricultural spraying of antibiotics that will only further the spread of antibiotic disease. It also means you’ll avoid exposure to citrus red No. 2, a toxic artificial dye that is sometimes sprayed on Florida oranges.

As Donley stated, the potential risks of this plan outweigh the benefits. “Our issue is that these drugs are a really lousy answer to a complex problem ... This is just another example of the pesticide office of the EPA approving a pesticide that’s not been studied well enough for the agency to make a competent decision on its safety.”

Reference: *Federal Register* December 4, 2018. USDA *Citrus Greening*. *National Geographic* March 1, 2016. *Center for Biological Diversity* December 6, 2018. *World Health Organization* November 7, 2017. *Florida Phoenix* January 2, 2019.

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## A Baking Soda Blessing

In scientific circles, NaHCO<sub>3</sub>, or sodium bicarbonate, is a substance with the more common designation of baking soda. A recent study shows that baking soda does much more than serve as a leavening agent. The Journal of Immunology reports that in a clinical setting, baking soda also “stimulates splenic anti-inflammatory pathways” or, in layman’s terms, fights inflammation in the spleen. From the outset, the study

clarification to explain the foundation of the study: that baking soda provides a signal to mesothelial cells, which line your internal organs and other body cavities to prevent them from sticking or rubbing together. Meanwhile, they assure these cells that your body is doing fine, so developing an aggressive immune system response is unnecessary.

Today, you’ll find baking soda in most household cupboards, but in the

letes for decades, as the soda increases the buffer-like action of lactic acid. People who engage in intense exercise don’t experience the accumulation of lactate and subsequent muscle pain, which naturally results in better and more comfortable workouts. So much help for so little cost!

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Reference: *The Journal of Immunology* April 2018, *Clinical Journal of the American Society of Nephrology* September 7, 2016; 11 (9):1546-56. *Kidney International* March 2014; 85(3):529-35. *Medical News Today* April 26, 2018. *Journal of Medical Toxicology* September 2013; 9(3):255-58.

**“...trials indicate that taking sodium bicarbonate by mouth may slow the rate of degeneration in kidney function .”**

premise notes that chronic inflammation is a major factor in both acute and chronic kidney injury, and trials indicate that taking sodium bicarbonate by mouth may slow the rate of degeneration in kidney function in patients with chronic kidney disease, or CKD.

While the scientists weren’t sure which mechanism prompted the mediation, they went with the indications that if inflammation made CKD worse, baking soda might help reduce it. Medical News Today offers a short

19th century a healing concoction known as “vinegar punch,” was made from apple cider vinegar mixed with a pinch of baking soda, which required a quick stir and a quick gulp. It was often used for gastrointestinal discomfort and usually elicited relief from pain, upset stomach, heartburn, acid reflux and even diarrhea.

But there’s more to baking soda for improving health than folk tale. Another study notes that baking soda has been useful for runners and other ath-

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assessing the value of nitrate salts and beetroot supplementation for high blood pressure (hypertension): *“Diets including food products rich in inorganic nitrate are associated with lower blood pressure (BP) ...Inorganic nitrate and beetroot juice supplementation was associated with a significant reduction in systolic BP ...The volume of the beetroot juice drinks ranged from 140 to 500 mL/d and the beetroot juice was given as a concentrated solution in two studies ...”*

While raw beets (and the beet greens!) do an excellent job of raising your nitric oxide production, they’re actually not the most nitrate-rich of plant foods. Aside from red beets, you have many other options. Topping the list of nitrate-rich plant foods is arugula, which typically averages 480 milligrams (mg) of nitrates per 100 grams. Compare that to raw red beets, which average only 110 mg of nitrates per 100-gram serving, and beet greens, averaging about 177 mg per 100 grams. Fermented



beets, on the other hand, contain 2 to 3 grams of nitrates per 100 grams, making it an ideal source.

As for arugula, it also contains potassium, calcium and magnesium, all of which are important for healthy blood pressure. These nutrients also help decrease your risk of a stroke and heart attack, while folate assists in optimal amino acid metabolism. Insufficient folate can promote unwanted homocysteine levels in your blood, which elevates your heart disease risk.

As a cruciferous vegetable, arugula also helps protect against cancer, courtesy of its glucosinolate compounds, which contain sulfur. Loaded with chlorophyll, some small studies have shown it may even have detoxifying properties to counteract the poisoning effects of heavy metals in the system, particularly in the liver. Both arugula and beets are easy to use, and you can quickly ferment beets at home, allowing you to have a fresh supply of nitric oxide-boosting foods on hand. Other nitrate-rich plant foods you may want to consider growing and eating — all of which will raise your nitric oxide production — include rhu-

barb, cilantro, butter lettuce, spring greens like mesclun mix, basil and Swiss chard.

Your body loses about 10 percent of its ability to produce nitric oxide for every decade of life, which is why it’s important to take steps to increase your nitric oxide production, especially as you age. One way to do this is by eating nitrate-rich plant foods such as arugula and fermented beets, as the plant-based nitrates are converted into nitric oxide in your body. Adding probi-

otics into the mix may optimize the effect even further. Together, these lifestyle strategies can go a long way toward protecting your cardiovascular health as you age, and support overall good health, and are especially important if you struggle with high blood pressure.



Reference: World Cancer Research Fund: *Food Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective* November 2007. *Nutrition Action* March 5, 2018. *Carcinogenesis* 1989 Feb; 10(2):397-9. *Cell Metabolism* 2018 July 3; 28(1):9-22. *American Journal of Cell Physiology* 2017 March 1; 312(3): 254-62. *The Journal of Nutrition* May, 2016. *Hypertension* 2008 March; 51(3):784-90. *Nutrition Journal* Dec. 11, 2012; 11:106.



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