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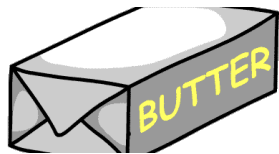
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Our February 2021 Newsletter for Healthy Living

Butter Is Better

After being vilified for decades, butter is back and booming. Not only has it made a comeback, but sales are soaring, with per capita butter consumption up 24% in the U.S. over the last decade. Changes in eating habits due to the pandemic pushed demand for butter even higher in 2020. Data from the U.S. Department of Agriculture concur, showing a 6% rise in butter production during the first six months of 2020, with trends suggesting it may top 2 billion pounds for the year — the highest it's been since 1943.

In the early 1900s, per-capita annual butter consumption in the U.S. was greater than 15 pounds, but this dropped sharply as margarine consumption increased. The dairy industry fought back from the beginning, when margarine entered the marketplace in 1869.



Despite the initial backlash, margarine, with its lower price and claims of superior

health benefits, soared in popularity by the middle of the century and outpaced butter consumption in 1957. As saturated fats fell out of favor, and health officials wrongly urged Americans to avoid such healthy fats as butter to reduce their risk of heart disease and lose weight, margarine, which came to be made with refined vegetable oils and trans fats, became the go-to spread and ingredient.

We now know that refined vegetable oils are among the worst foods to consume, and a prominent study released in 1997, which examined the ef-

fects of margarine on cardiovascular disease, revealed that margarine increases your heart attack risk. Still, for decades margarine remained more popular than butter; it wasn't until 2005 that butter regained its top title, and consumption has been on the rise ever since. Butter is still regarded by many as a guilty pleasure, one of those foods that you shouldn't really be eating, but indulge in anyway because it's just so good. But

study author Mahshid Dehghan, a senior research associate and nutrition epidemiology investigator at McMaster University in Hamilton, Ontario, noted in this study, "Our results showed an inverse association between total dairy and mortality and major cardiovascular disease. The risk of stroke was markedly lower with higher consumption of dairy."

Keep in mind that butter's nutritional value depends on how the animals

"Multiple studies have shown that food products from animals raised on pasture contain higher amounts of nutrients."

this is one case where you can indulge guilt-free, because butter is a health food — especially when it's made with milk from grass fed cows.

Unlike heavily processed margarine, butter is a whole food that contains nutrients your body needs. Multiple compounds in butterfat are associated with health benefits, including: Vitamins D, E, K2 and A (in its most absorbable form), fatty acids, minerals, CLA, antioxidants, lauric acid, lecithin and cholesterol. Multiple studies support butter consumption for good health. In a systematic review and meta-analysis of nine publications including 15 country-specific cohorts, butter consumption was not significantly associated with cardiovascular disease, coronary heart disease or stroke, but increased consumption was associated with a lower incidence of diabetes. It's not surprising, then, that accumulating research supports the consumption of whole-fat dairy like butter.

The Prospective Urban Rural Epidemiology (PURE) study, published in *The Lancet*, is among them. As lead

are raised, as the fatty acid composition of butterfat varies according to the animal's diet. The very best quality butter is raw (unpasteurized) from grass fed cows, preferably certified organic. The next best is pasteurized butter from grass fed or pastured organic cows, followed by regular pasteurized butter. Even the latter two are healthier choices by orders of magnitude than margarines or other vegetable-oil based spreads.

Why is grass fed butter better? Milk from cows raised primarily on pasture has been shown to be higher in many nutrients, including vitamin E, beta-carotene and the healthy fats omega-3 and CLA. The improved fatty acid profile in grass-fed organic milk and dairy products brings the omega-6 to omega-3 ratio to a near 1-to-1, compared to 5.7-to-1 in conventional whole milk. This is important, since the majority of Americans eat 10 to 15 times the amount of omega-6s compared to what they eat in omega-3s. "Because of often high per-capita dairy consumption relative to

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The Humble Onion

A 2019 survey of 2,000 people in the U.S. crowned corn the new favorite vegetable, with an approval rating of 91%. Onions followed not far behind with an approval rating of 87%, making it among the top five favorite vegetables. The survey found some of the least favorite vegetables included asparagus, mushrooms and eggplant. Many experts believe that the first onions appeared in

U.S. The top producing states are California, Eastern Oregon, Idaho and Washington. Other countries producing a large number of onions include Turkey, Pakistan, China and India. According to Live Science, the average person in the U.S. eats 20 pounds of onions each year.

It's likely the many health benefits derived from eating onions comes

damage contributing to chronic diseases such as diabetes and heart disease. In addition to the calcium content promoting strong bones, onions may also relieve oxidative stress, which in turn decreases bone loss and can help prevent osteoporosis. Onions are also good sources of vitamins A and K, which in addition to vitamin C help protect your skin from ultraviolet rays. Vitamin C also helps your body produce collagen, a structural support for your skin and hair.

Quercetin is another compound found in onions that is linked to a large number of health benefits. This single antioxidant flavonoid is found in high concentrations in onions. Researchers have found some onions store quercetin in the outer layers and others have higher concentration in the inner layers.



Red onions have the highest levels in the outer layers, whereas the highest levels of quercetin were detected in the inner layer of the yellow onion.

In this study, data showed the yellow onions had more total quercetin than red onions; the most common onions are red, yellow and white. There are two main classes of flavonoids in onions — anthocyanins that are responsible for the color of red onions and quercetin that is responsible for the yellow and brown skins of other varieties.

Reference: International Dairy Foods Association September 14, 2020. *Epidemiology* 1997 March; 8(2):144-9. *Dairy Herd Management* November 17, 2020. Weston A. Price Foundation January 1, 2020. *PLoS One* 2016 June 29; 11(6):e0158118. doi: 10.1371/journal.pone.0158118. eCollection 2016. *The Lancet* September 11, 2018. *WebMD* 2013-2018. *Food Science and Nutrition* February 28, 2018. *Critical Reviews in Food Science and Nutrition*, 1-11, doi: 10.1080/10408398.2018.1465888

“Onions have over 25 varieties of flavonoids that help prevent cellular damage.”

Central Asia.

Most agree the vegetable has been cultivated for nearly 5,000 years and might be one of the first cultivated crops since they are easy to grow and transport, and have a long shelf life. Pliny the Elder catalogued how Romans used onions in Pompeii before being killed by the volcano. His documents showed that onions' curative powers included the ability to induce sleep, heal toothaches and mouth sores and address vision problems. Others have documented their use in the treatment of headaches and heart disease. In the Middle Ages, onions were used to help relieve headaches, hair loss and help to pay the rent. The first pilgrims brought them on the Mayflower to America to cultivate, where they became one of the first products brought to market in New England.

Onions are a member of the allium family, which also includes leeks, shallots, garlic and chives. About 125,000 acres produce 6.2 billion pounds of onions each year in the

from the nutrient value of the vegetable. One small onion has just 28 calories, 6.5 grams (g) of carbohydrate and 1.1 g of total fiber. It also contains: calcium, 16.1 milligrams (mg); magnesium, 7 mg; potassium, 102 mg; vitamin C, 5.18 mg, and choline, 4.27 mg. Onions are also surprisingly high in beneficial polyphenols. This group of plant compounds plays an important role in the prevention and reduction of diabetes, cancer and cardiovascular diseases.

In a comparison of the polyphenol and antioxidant capacity between red and yellow onions researchers found the outer layers of the onions had the highest number of total polyphenols and flavonoids. The outer layers of both types of onions also had the highest antioxidant activity. However, overall, the red onion had better antioxidant activity, with a higher number of total polyphenols and flavonoids that were associated with antioxidant activity.

Onions have over 25 varieties of flavonoids that help prevent cellular

most other sources of omega-3 fatty acids and conjugated linoleic acid, these differences in grassmilk [grass fed milk] can help restore a historical balance of fatty acids and potentially reduce the risk of cardiovascular and other metabolic diseases,” researchers noted.

A study published in *Critical*

Reviews in Food Science and nutrition also highlighted the differences in human health after consuming the same

foods from animals raised in different ways: “Multiple studies have shown that food products from animals raised on pasture instead of grains contain signifi-



cantly higher amounts of nutrients that may protect against cancer, like omega-3 fatty acids and conjugated linoleic acid. Due to the general recommendation against dietary fat consumption over the past several decades, there has been a lack of scientific dialogue regarding the differences pasture-raised animal byproducts may have on health and cancer prevention.”

Indeed, they found that while lipid levels remained relatively neutral overall, significant differences were found in inflammatory markers and phospholipids depending on whether the animal foods came from animals fed grass or grains: “While red meat, butter, cheese, and eggs have been generally treated as nutritional boogymen with most nutritional recommendations endorsing their avoidance, these individual

foods may vary significantly in nutritional value and the corresponding effect on consumers.”

“Grass-fed butter, n-3 enriched eggs, and wild game meat appear to have a neutral effect on serum lipids while providing a decrease in several inflammatory factors, potentially improving health. Significant data exist illustrating a marked physiological effect from consuming the exact same food produced from animals raised differently, and this finding could have a large impact on population-wide dietary recommendations if controlled for in future studies.”

Reference: International Dairy Foods Association September 14, 2020. *Epidemiology* 1997 March; 8(2):144-9. *Dairy Herd Management* November 17, 2020. Weston A. Price Foundation January 1, 2020. *PLoS One* 2016 June 29; 11(6):e0158118. doi: 10.1371/journal.pone.0158118. eCollection 2016. *The Lancet* September 11, 2018. *WebMD* 2013-2018. *Food Science and Nutrition* February 28, 2018. *Critical Reviews in Food Science and Nutrition*, 1-11, doi:

Amazing Astaxanthin


Astaxanthin is a naturally occurring carotenoid with a wide variety of nutraceutical applications in the fight against diseases. Data now reveal astaxanthin has significant promise as a geroprotector, helping to slow brain aging. Astaxanthin is responsible for the

“When compared to other antioxidants such as lycopene, vitamin E and vitamin A,” astaxanthin is the ‘King of Antioxidants’.”

pink or red color of salmon, trout, lobster and other seafood.

According to *Science Direct*, “when compared to other antioxidants such as lycopene, vitamin E and vitamin A,” astaxanthin comes out on top and is often referred to as the “king of antioxidants”. It is derived from *Haematococcus microalgae*, which produce astaxanthin as a protective mechanism to shield from harsh ultraviolet (UV) light. In your body, it works as an antioxidant to help protect against reactive oxygen species and oxidation. These processes play a role in aging, heart disease, Alzheimer's disease and Parkinson's disease.

Data show astaxanthin can protect your skin against free radical damage from UV light from the inside out.



In 2015, NASA presented at the 66th International Astronautical Conference and shared information showing that a supply of astaxanthin from natural sources could potentially prevent the negative effects of radiation exposure, damage to the eyes and other health effects known to occur to astronauts in space. Researchers writing in the journal *Marine Drugs* recognize the challenge of maintaining brain function and well-being as human life expectancy lengthens.

Recent studies have evaluated the neuroprotective effect astaxanthin has on preserving brain aging in experimental models. In their review of the literature, the scientists identified several pathways astaxanthin may take in slowing brain aging. They evaluated the results of clinical trials where the endpoint measure was disease and disability. They found several studies where astaxanthin modulated biological mechanisms, including transcription factors and genes directly related to longevity.

One of the main relevant factors modulated by astaxanthin is the forkhead box O3 gene (FOXO3). This is one of only two genes with a significant

impact on human longevity. Additionally, in their search of the literature, they found astaxanthin increases brain-derived neurotrophic factor (BDNF) levels in the brain and can attenuate oxidative damage to DNA, lipids and protein. They concluded that it was possible

astaxanthin can promote longevity and slow the rate of aging.

The neuroprotective properties appear to be attributed to astaxanthin's ability to reduce oxidative stress and inflammation as well as improve mitochondrial function and the dysregulation of gene expression that occurs with aging. The data showing astaxanthin may help slow brain aging is significant since the neurological aging process is directly tied to cognitive function. Cognitive changes that can occur, but are not necessarily normal, include finding it difficult to remember words, recall names, having difficulty with multitasking or having more difficulty paying attention. According to the National Institute on Aging, some of the common changes that can occur in the brain include loss of brain volume, decreased blood flow, inflammation and reduced effectiveness in communication between neurons. Each of these changes affect cognitive function.

After age 40, data show the volume of the brain can decline at a rate of 5% for every decade. This rate can increase as a person reaches 70 and older. The primary factor for this shrinking is unclear but scientists suggest there is a decline in volume rather than in the number of neurons that may have a relationship to gender. Although experts find there are common changes in thinking abilities that decline with age, they also find reading, vocabulary and verbal reasoning may improve as a person ages. With abnormal aging changes, there may be severe cognitive impairment that affects memory, problem solving and behavior, associated with dementia.

According to the Alzheimer's Association, there are more than 5 million in the U.S. who have Alzheimer's and that number is expected to nearly triple to 14 million by 2050. The cost of these dementias is projected to be \$305 billion in 2020 and estimated to rise as high as \$1.1 trillion by 2050.

Although astaxanthin is related to beta-carotene, lutein and canthaxanthin, the molecular structure is unique and more potent than other carotenoids.

A key difference is that astaxanthin has a surplus of electrons to donate as it neutralizes free radicals. Antioxidants work by donating one of their electrons to a free radical in order to stabilize it. However, in donating an electron the antioxidant may then become unstable.

Astaxanthin has a surplus of electrons and so can donate many times without becoming unstable itself.

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One of the more unique features of astaxanthin is that it's able to protect both water- and fat-soluble parts of the cell. This feature makes astaxanthin powerful. In one study analyzing several antioxidants and their effectiveness, data show astaxanthin had antioxidant power greater than alpha-lipoic acid, CoQ10, green tea catechins and vitamin C. Most antioxidant carotenoids are either water-soluble or fat-soluble, but astaxanthin can interface between water and fat, which makes it more effective.

Astaxanthin also can cross the blood-brain barrier, where it can exert a strong protective effect on your neurological health. Lastly, astaxanthin cannot function as a prooxidant, which are molecules that cause rather than combat oxidation. Other antioxidants can be prooxidants when there is a sufficient concentration. However, astaxanthin will not function as a prooxidant, even when present in large amounts.

Reference: *Marine Drugs*, 2020; 18(7). *RxList*, Astaxanthin, What Is Astaxanthin? *Science Direct*, Astaxanthins, White Biotechnology in Cosmetics. *Science Direct*, Astaxanthins, Nutraceuticals from Algae and Cyanobacteria. *Frontiers in Physiology*, 2018; doi.org/10.3389/fphys.2018.00477. *Green Living Magazine*, Amazing Astaxanthin the Antioxidant. NASA, Benefits of Microalgae for Human Space Exploration. NASA, Microalgae Biosynthesis in Microgravity. National Institute on Aging, How the Aging Brain Affects Thinking, Changes in the Aging Brain. *Postgraduate Medical Journal*, 2006; 82:964. UCSF Weill Institute for Neurosciences, Healthy Aging. Alzheimer's Association, Facts and Figures, Quick Facts. *Science Direct*, Astaxanthins. *Save Our Bones*, Astaxanthin: A Superior Bone-healthy Antioxidant. *Carotenoid Science*, 2007; 11:16. *Science Direct*, Astaxanthins, Role of Astaxanthin in Sports Nutrition. *Oxidative Medicine and Cell Longevity*, 2019; 3849692