

**Commentary**

## The Wisdom of Fruit Trees

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### Garden Wisdom:

“To be ignorant of history is to remain always a child.”

— Marcus Tullius Cicero (1)

“Study history, study history.”

— Winston S. Churchill (1)

“Healthy citizens are the greatest asset any country can have.”

— Winston S. Churchill (1)

“If you have a garden and a library, you have everything you need.”

– Marcus Tullius Cicero [1].

During this past Mother’s Day, I thought of the family stories that my Mother told me years ago. While she was growing up – during the Great Depression and World War II – my Grandmother grew most of the food for the family in her garden. My Mother would tell me about delicious pears from her parent’s fruit trees. During the war, my Grandfather’s employer provided additional garden space for the workers families to use for gardens. Years later, I learned more about that time period through reading a range of literature [2, 3, 4]. During World War II, store-bought food was strictly rationed so that more food could be sent for those overseas. Americans grew “Victory Gardens” in their yards, even their front yards in order to better provide for their families; 40 percent of America’s fresh produce during the war was grown in Victory Gardens. People’s yards and their ability to transform them into Victory Gardens were a vital national resource for the welfare of the nation. This was an example of how resilient nations are built with the building blocks of strong, resourceful families [5, 6]. The wheat wreaths on the World War II Memorial in Washington D.C. pay homage to this “can do” spirit of self-reliance. Some argue that megacities—where the multitude lives in tiny “coffin” apartments –are more sustainable than suburban homes enlivened with private yards and gardens [7, 8, 9]. However,

history teaches us that suburban yards – that can quickly and readily be transformed for food production – are an important insurance policy, a buffer for the nation– and families– during trying times. Another lesson from history is that it is cyclic and there will always be trying periods – either personally or nationally or globally. Unfortunately, too often these days, the lessons of history concerning the necessity of resilience and autonomy are lost [10, 11, 12].



Figure-1: World War II Memorial in Washington DC

During the Great Depression, unemployed individuals stood in bread lines and soup kitchens. [4] Many were city dwellers and those who had moved to the cities due to the environmental disaster (the “great dust bowl”) in the mid-west. When I visited Washington D.C., I saw the monument of remembrance to that time in history.

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**Sub Date:** June 7<sup>th</sup>, 2018, **Acc Date:** June 19<sup>th</sup>, 2018, **Pub Date:** June 19<sup>th</sup>, 2018.

**Citation:** Celia M Ross (2018) The Wisdom of Fruit Trees. BAOJ Nutrition 4: 053.

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Figure-2 : A memorial to the bread lines of the Great Depression

Health educators encourage people to eat more fresh fruit; however, individuals who are facing food insecurity, low income, homelessness, and / or residing in “food deserts” (poor urban areas where access to nutritious food is limited) are especially prone to having low fruit intake; many approaches are being tried to address this issue [13, 14, 15]. An emerging tactic for tackling this public health dilemma is making urban public green spaces fruitful with fruit trees [16, 17, 18, 19]. Why not turn selected park spaces into fruitful parks, somewhat similar to the biodiversity “food forests” that were used by some ancient cultures? [20, 21] Growing diverse native food bushes and trees – such as blueberry bushes in the North-Eastern and Mid-Atlantic United States – in parks and home gardens, has the added benefit of supporting biodiversity; balanced interconnectedness of all living things – from microbes to plants to birds to butterflies to poodles to people – that may promote human wellbeing and health [22, 23, 24, 25]. Family unit home Victory Gardens might be far more efficient and favorable compared to communal gardens; however, in today’s society, many individuals don’t have that option – especially the homeless [26, 27, 28]. “Food forests” may be of both public health and ecological benefit. “Food forests” could be used as part of a wise multi-pronged

approach to increasing fruit consumption.

### Wisdom of Fruit: Eat Your Medicine

“Let Food Be Thy Medicine and Medicine Be Thy Food.” — Hippocrates (1)

Throughout history, and likely prehistory, certain foods – especially fruits and berries – have been regarded as being important for supporting health [29, 30, 31, 32, 33]. More recently, researchers are delving into the many possible physiological and molecular mechanisms behind this wisdom. [34, 35]

There are indications that certain polyphenols and their metabolites might be preferentially taken-up by the brain, and might even tend to concentrate in or even target specific regions of the brain – such as, the hippocampus, frontal cortex, striatum, and cerebellum [36, 37] The hippocampus plays a key role in memory formation – moving short-term memories into long-term storage. [38] There are hints that polyphenols might help to support memory formation [39, 40] The frontal lobe is involved in executive function – working memory, planning, and wisdom. [38] Polyphenols may help support executive function. [41, 42, 43]. The striatum and cerebellum plays roles in the processing environmental input to emotional expression output [38]. Polyphenols may help support emotional wellbeing [44, 45, 46] While association does not prove causation, these relationships are intriguing. Continued research on the possible pathways by which polyphenols might promote brain health is needed. Much more research needs to be done in on the topic of certain polyphenols possibly targeting various areas of the brain, why this might be, and possible implications in health science and nutrition wisdom.

It has been suggested that both epigenetic and transposable elements (jumping genes) influence brain health. [47, 48, 49] One of the many roles of epigenetic signaling is the regulation transposable elements. It is thus believed that factors which influence certain epigenetic markers, may also in turn, influence transposon activity (the jumpiness of jumping genes). Microbial metabolites – such as short chain fatty acids (SCFA) and various metabolites of dietary polyphenols – are believed to play various roles in influencing the host epigenome and thus phenotype. Dietary composition – including fruit fiber and polyphenols – influences the activity of the gut microbiota; this might play a role in brain health [50, 51].

It has been suggested that tyrosine – an amino acid that boosts the production of dopamine in the brain and is found abundantly in some fruits – may support innovative thinking [52]. Innovative thinking is crucial in entrepreneurial and STEM (science, technology, engineering, and math) endeavors – the corner stones of modern economic advancement. As Einstein once stated, “imagination is more important than knowledge.” [53]. Imaginative, innovative cogitating may reveal wise solutions to problems that conventional, linear reasoning can miss.

Sea products tend to have significant levels of iodine [54]. The use of fish scrapes, seaweed, and other sea products as garden fertilizer is ancient wisdom [55]. Could part of that wisdom be due to the fact that fish are a source of iodine? Many modern organic farmers continue this tradition by using fertilizers that contain fish by-products. Recently, it has been

asserted that fertilizer for fruit trees and vegetable plants should include iodine (KI) in order to increase the levels of iodine in produce and thus help support adequate levels of iodine in the diet [56]. Sufficient levels of dietary iodine are critical for brain health; however, the U.S. population experienced a sharp decrease in iodine levels recently, raising concern among health professionals [57, 58, 59]. Perhaps we can borrow from ancient wisdom.

Fruits are fair to excellent sources of electrolytes – potassium and magnesium – that may help support brain health. [60, 61, 62]. However, various social factors have resulted in the increased consumption of ultra-processed foods – foods that are low in potassium and magnesium – during the latter part of the 20<sup>th</sup> century [63, 64, 65]. Hopefully, this trend might be starting to reverse due to a number of factors [65, 66]. For example, technology is empowering more women to become homepreneurs (entrepreneurs working from their homes) or telecommuters, healthier lifestyles that enable women to take better control of their schedule and thus their diet and that of their families [65]. As a way around the “glass ceiling,” the autonomy of entrepreneurship can also offer greater opportunities for professional development and rewarding careers than what is available at many corporate workplaces [67]. This is the new, wiser women’s movement and also a revived holistic wellness movement [67, 68].

Enjoying a fruit salad is a multisensory experience. Could fruit begin impacting our brains even before it enters our mouths? Recent studies are beginning to investigate the psychological and neurological effects of fruit scents [69, 70, 71]. This raises the question, what small fraction of the brain wellness benefits of eating fruit might be partially due to the sensory stimulation of smelling the fruit as it is consumed? Could this be one of a multitude of factors contributing to the superiority of a real food diet over reliance on a few supplement pills taken in an attempt to round out a diet of ultra-processed foods? Continued research is needed on the benefits of a holistic approach to nutrition. [72]. Through the wisdom of synergy, the whole may be greater than the sum of the parts.

For numerous reasons, there was great wisdom in my grandparent’s pear tree.

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