

Review

Health Nuts: Nutrition, Economics, and Public Health Entrepreneurship

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Societal changes have led many people to prefer food that is fast and convenient. However, many ultra-processed foods are considered to be “junk foods” with poor nutritional value and potentially significant adverse health effects. Social entrepreneurs, who base their business model on moral / religious convictions as well as the business’ profit potential, can create sustainable solutions to various public health issues such as this one.

Key Words: Ultra-Processed Foods; Health; Social Entrepreneurship; Public Health; Entrepreneur; Austrian School of Economics; Ethics; Nuts; Brain

Social Issue: Junk Food

Various factors contribute to relying on convenient, fast, ultra-processed foods including: heavy workloads, stress, time constraints, and food access [1,2,3,4]. Thus, junk foods, that are low in nutrients and are laden with unhealthy ingredients, have become a major part of the modern diet [5,6,7,8,9]. Consuming a diet containing large amounts of high fructose corn syrup, trans-fatty acids, and salt while important nutrients have been refined out, may lead to poor health [5,6,10,11,12,13,14,15,16]. One of the many mechanisms by which a healthy diet helps to foster wellbeing may be by supporting a healthy epigenome [17,18,19].

Epigenetics

There has been increasing interest in epigenetics as a key factor in health and disease, including: cancer, cognitive / emotional issues, cardiovascular disease, and diabetes [20, 21, 22, 23]. Using an analogy, if the genome is the cell’s cookbook with genes being the recipes, epigenetic markers are sticky-notes telling the chef which recipes to prepare when, where, and how much [24,25]. For example: it is not good, when you are expecting a dinner party of 50 people, to prepare 5 servings of food; nor is it good when you are expecting 50 people to prepare 5,000 servings of food. In addition, people might complain if the chef were to serve a meal of oatmeal and orange juice as the Thanksgiving dinner. Thus there is a need for sticky-notes (epigenetics) to inform the chef (cell) about the guest list and event (physiological requirements). There has also been an increasing

recognition of the awe-inspiring complexity of epigenetic mechanisms that fine-tune gene expression and how these mechanisms are influenced by the environmental factors, such as diet [17].

Nuts: Epigenetics and More

Tree nuts are rich in nutrients and have been found to offer health benefits throughout the life cycle, confirming traditional wisdom about their place in a healthy diet [26,27,28,29,30,31, 32,33,34]. Tree nuts contain nutrients such as: magnesium, choline, phytochemicals, polyunsaturated fatty acids (PUFAs), vitamin B6, and selenium (Brazil nuts) – which help support a healthy epigenome, as well as having numerous other important physiological benefits. [18,19,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50]. Nutritionists recommend tree nuts as part of a healthy diet (except of course for those with allergies to nuts). Replacing junk food snacks with tree nuts can be a significant dietary improvement [41,51]. Snacking on a few Brazil nuts daily helps ensure an adequate intake of selenium [35]. Snacking on walnuts or pecans has been recommended as a way to increase polyphenol and essential fatty acid intake [41,52]. The nutrient-rich Mediterranean diet, which includes nuts, has been recommended for promoting a healthy epigenome [18,53].

Nuts: Brain Food

In an animal model, maternal consumption of walnuts was found to improve the cognitive performance of offspring (54). A ketogenic

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Sub Date: January 9th 2018, **Acc Date:** January 22nd 2018, **Pub Date:** January 23rd 2018

Citation: Celia M Ross (2018) Health nuts: nutrition, economics, and public health entrepreneurship. BAOJ Nutrition 4: 046.

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diet, with ample amounts of PUFA-containing nuts, has been used to successfully treat medically intractable Lennox-Gastaut syndrome seizures [55]. Reducing red meat consumption and replacing it with nuts may reduce the risk of stroke [56]. There are some hints that a diet rich in nuts might help to protect the brain from some environmental insults, including cadmium exposure and amnesia [57,58,59]. Tree nuts, such as walnuts, almonds, and hazelnuts, have been recommended as a source of phytochemicals that may help slow cognitive decline in older adults through numerous molecular mechanisms [31,60].

Did tree nuts also aid in supporting the evolution of the human brain? Two of the main conjectures concerning better nutrition helping to facilitate the evolution of the brain include the lake shore hypothesis and the fruit hypothesis. According to the lake shore hypothesis, omega-3 fatty acid rich marine foods provided nutritional support for the evolution of the human brain [61,62,63]. It has also been found that primate species that consume more fruit have larger brains – might this be partially related to the polyphenol content of the fruits? [64,65,66]. Could have omega-3-rich, polyphenol-rich nuts combined with communal nut processing also supported human cognitive progress? [31,67].

The Austrian School of Economics, Entrepreneurship, and Solving Social Problems

Large bureaucracies are not always the most efficient way to solve social problems [68,69,70]. The Austrian school of economics offers a different approach. The Austrian school acknowledges that the actions of individual entrepreneurs are the engines that drive economic and societal improvements – when unleashed by a favorable political / cultural structure [71,72,73]. In seeking to earn a living, the entrepreneur uses his / her judgment and creative thinking to determine what sort of new products / services to develop that will meet the needs of consumers. The entrepreneur independently analyzes the prevailing conditions and the needs of society. Since he / she needs to judge correctly and work efficiently in order to earn a living, the entrepreneur is highly motivated and to be effectual. The entrepreneur develops a business based on his / her moral / religious convictions as well as the business' profit potential [74,75]. This provides a theoretical framework for social entrepreneurship. Social entrepreneurship, directed by a moral / religious compass, is a sustainable force for positive social change [74,76, 77,78]. This indicates the economic advantages of a social structure / culture that is both favorable to entrepreneurship and is instilled with a strong positive moral / religious character.

Social / Public Health Entrepreneurs Seek to Replace Junk Food with Nut Products for Healthier Communities

All great change in America begins at the dinner table. – Ronald Reagan [79]

Let's take a look at some entrepreneurs who saw that the public needs food

that is convenient for a busy lifestyle but is also nutritious – not junk food. They started their businesses from home, perhaps “at the dinner table.”

By combining “dinner table” lessons in values, health consciousness, academic excellence via customized education and independent learning, creativity, rugged individualism, and chutzpah, homeschooling may prepare students to be the next generation of social change leaders – including becoming public health entrepreneurs [80,81,82,83,84,85, 86,87,88,89,90,91]. An example of a homeschooled turned public health entrepreneur is Abby Kircher [88,89,90]. Experimenting in her kitchen in North Carolina, 15-year-old Abby worked on developing healthy, all-natural nut butters. Her friends and family loved the products. Abby's mother encouraged her to become an entrepreneur. Abby started selling her products at a local farmer's market. When grocery stores approached her wanting to carry her products, Abby found a commercial kitchen and started making large batches of her nut butters. The first year of grocery store sales generated a quarter-of-a-million dollars in revenue for her business. Abby plans to take business courses in college and apply the knowledge to growing her business.

Chelann Gienger is another homeschooled who became a public health entrepreneur with a business that includes nut butters [91]. Chelann wanted to develop a healthy alternative to traditional fast-food restaurants in her community. Working together with family members, she founded NUYYU Juice Bar. She sells a variety of smoothies made with ingredients such as: fresh fruits, vegetables, and nut butters – ingredients many nutritionists consider to be health-promoting “functional foods” [91,92]. Her juice bar has a pleasant ambiance and plenty of seating – inviting people to sit and socialize, work, or study while sipping nutritious smoothies [91].

Methodology

Eclectic methodology was employed in this speculative paper. Utilizing an element of informed intuition as one of the facets of scientific investigation draws upon the paradigm exemplified by the work of George Washington Carver [93,94,95]. Intuitive, freeform PubMed surfing and other reading was used to search for possible connections between items. Prior familiarity with numerous topics from many years of freeform PubMed surfing and study helped to inform the search.

Final Considerations

Public health and societal issues are far greater than what bureaucracies have the capacity to cover [96]. Social entrepreneurship is a sustainable answer to this dilemma [97,98]. Educational models, such as homeschooling in some cases, need to be geared toward preparing the next generation for this career route. In addition, it has been noted that women are now turning a keen eye toward and excelling in business and economics – with a growing interest in social entrepreneurship [97,99,100,101,102].

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