

**Commentary**

**Public Health Entrepreneurship: A look at Fruitguys**

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**Abstract**

This commentary is the first in a series that will look at how public health entrepreneurship is providing answers to the health challenges the U.S. is facing. Entrepreneurship is a powerful force that can be directed for the social good of promoting better community health. This commentary will focus on the company Fruitguys.

**Public Health Entrepreneurship**

Governmental public health budgets are constrained by economic factors, leaving unmet needs [1,2]. Entrepreneurs are stepping up to the challenge with the time-honored American spirit of innovation and self-reliance to solve the public health problems of today [2,3]. Free market, public health entrepreneurship is a noble endeavor because it is a righteous way for the individual to serve others [4,2].

**Public Health Crisis: Americans Need to Eat More Fruit Instead of Ultra-Processed Snacks**

The mean US consumption of fruit is 93.2 g/day which is far less than the recommended 300 g/day [5]. Instead of fruit for snacks, Americans too often choose hyper-palatable, energy-dense, fatty, sugary or salty ultra-processed snacks often from convenient workplace vending machines [6,7]. Ultra-processed snacks contribute to obesity and a wide range of chronic diseases [6]. In addition, unhealthy eating habits have adverse effects on cognitive performance [8]. This is a serious concern in a knowledge economy where every employee needs to contribute to continuous innovation and organizational self-renewal [9]. Likewise, as the population ages, the need to promote brain health and reduce dementia risk becomes critical [10,11].

Increasing the amount of fruit you eat can help improve the quality of your diet. Fruit is rich in polyphenols [12,13,14]. Dietary polyphenols impact physiology through three routes: being absorbed from the digestive tract, modulating micro biota, and being digested by the gut micro biota into bioactive phenolic metabolites [12,15,16,17,18]. These actions promote health via: attenuating oxidative stress, influencing the epigenome, modulating gene expression, modulating neurotrophic signaling pathways, modulating sirtuin proteins, protecting mitochondrial

function, preventing the aggregation of amyloid- $\beta$  peptides, lowering systemic inflammation, improving cardiovascular and metabolic measures, and controlling oral biofilms [12,19,20,21,22,23,24,25,26,27,28,29,30,31]. It is interesting to note that some bioactive phenolic metabolites appear to specifically localize in the brain, possibly indicating that these metabolites are of critical importance for cognition [17]. Consistent with this, studies in human populations show that produce consumption is associated with better reaction time (attention), improved cognitive performance, better academic performance, calmer mood, flourishing (curiosity, creativity, motivation), and reduced risk of dementia, while a produce-rich maternal diet is associated with higher child IQs [32,33,34,35,36,37,8,11]. Thus a polyphenol-rich diet is recommended for brain health [38].

**Fruitguys**

Chris Mittelstaedt was desperate to find a way to better support his growing family [3,39]. Then a friend told him that office workers were always complaining about gaining weight [3]. As the old saying goes, “necessity is the mother of invention.” Thus, with a burst of inspiration, Chris saw how he could support his family while providing a service that would improve the health of the community. He started a business delivering fresh fruit to offices [3,39]. His initial customers were high tech businesses, where employees worked long hours and snacked on convenience products due to time constraints [39,40]. These high tech workers were “all eating like crap” until Fruitguys started providing them with fresh fruit [39]. The ubiquitous presence of vending machines

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offering calorie-dense, ultra-processed snacks entices workers into making poor food choices when they are seeking an afternoon energy boost [7]. Mittelstaedt's entrepreneurial public health business not only provided him with a means to support his family, it improved the nutrition of numerous office workers. One of his customers, a partner in certified public accounting firm, said "We do it for the same reason we provide health insurance. If our employees are healthy, they're more productive" [39]. Being able to fill an important need in the community allowed his business to grow, generating 30.5 million dollars in revenue in 2015 [3]. As Fruitguys has grown, it has maintained the entrepreneurial spirit of trying new ideas, creative problem solving, and resourcefulness [41,39,3]. This strength has helped it to weather economic downturns [42,41].

After Fruitguys fills the orders for the offices, there are "seconds" (less than perfect fruit) and left over fruit which are donated to feed the poor through a company program called "Good works" [43]. Donations amounted to 1.3 million servings of fruit in 2015. Through Good works, Fruitguys extends a helping hand to the vast number of Americans affected by harsh economic conditions [44,45,46,47,48,43].

## Discussion

There is an increasing awareness of the power that entrepreneurs have to be social value creators and contribute to the improvement and well-being of communities [49]. By providing convenient, nutritious snacks for those who work long hours, Fruitguys promotes healthy lifestyle choices. The Good works program harkens back to the ancient directive to make a portion available for gleaning by widows (Lev. 19:9; 23:22).

## Conflicts of Interest

Dr. Ross is the founder of the Delaware Gerontology Institute, LLC, an organization that is utilizing the principles of public health entrepreneurship.

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