

# OUR TIMES

## Food and Hunger in the World

A PUBLICATION OF THE SHARONZ ACADEMY MIDDLE SCHOOL

### Natural Flavors: Are They Natural?

Elsa Skarsten

Did you know that a slightly sweet chemical derived from the anal secretion glands of beavers has been used in vanilla-flavored products (Spritzler)? Luckily, this flavoring (called castoreum) is not commonly used due to its high cost and rare extrication, though other flavors are. Castoreum, along with many other chemicals, can be found in “natural flavors”. People often look on the back of their seltzer can and find only two ingredients: carbonated water and natural flavors. But what exactly does the term “natural flavor” mean? It is unclear what can be defined as natural according to the Food and Drug Administration (FDA), versus the actual flavor manufacturers? Are natural flavors healthy to consume?

Natural flavors should be healthy for consumers because they are regulated by the

government. “Government regulations define natural flavors as those that derive their aroma or flavor chemicals from plant or animal sources, including fruit, meat, fish, spices, herbs, roots, leaves, buds, or bark that are distilled, fermented, or otherwise manipulated in a lab. This distinguishes them from artificial flavors, which use man-made chemicals to give a product its particular flavor or aroma” (Rabin). In order for a flavor to be classified as natural, it has to pass these regulations along with a few other measures for safety (i.e. sterile facility). The FDA oversees the production of said flavors to determine whether or not it passes safety requirements.

This can help to make natural flavors have slightly safer or possibly healthier ingredients than artificial flavors, which are regulated less

thoroughly.

Even though there are certain restrictions for natural flavor ingredients, flavor companies do not get required to disclose the ingredients used in their flavoring. This could result in some potentially harmful chemicals being able to squeeze their way into the long list of flavor ingredients. A flavor historian Berenstein said the ingredients in flavors don’t need to be specified partially because the names of compounds might only confuse people. She also stressed how the flavors are used in infinitesimal quantities (Choi). Some of the compounds that the FDA allows have even been shown to be semi-toxic in larger quantities (Choi). Not having full disclosure of the ingredients could be potentially

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### About This Newsletter

The students at The Sharon Academy Middle School have spent the last several months studying food and hunger on a local, national, and global level as a part of the school’s Integrated Curriculum. Each student researched specific issues relating to food and hunger that interested them individually and compiled what they learned in this newsletter. This collection of articles is intended to educate our community about the intricacies of this important topic from different perspectives. Just as researching these articles has informed our students about food and hunger, and encouraged them to examine more deeply the choices they make about food, we hope this newsletter will help you to do the same.

To learn more about The Sharon Academy Middle School and its innovative Integrated Curriculum, please see the back cover.



*This newsletter is dedicated in memory of Linda Blakeman, friend and parent of The Sharon Academy Middle School, and is produced with generous support by Dartmouth Printing.*

## The Sharon Academy's Food and Hunger Unit

With food and hunger being a large issue in this modern age, The Sharon Academy Middle School's unit teaches its students to make decisions about their food choices, and how to educate their friends, family and those around them. Through discussions, documentaries and the occasional lecture, students are encouraged to rethink their food choices and realize the impact food and hunger makes on their own lives, as well as those around them.

Of the six total units I've experienced in my two years at the Middle School, this one was easily the most impactful. Hunger, even here in our small, rural Vermont town of Sharon, is a large issue. One in seven children goes to bed hungry each night, and more and more people are relying on Vermont food shelves. The Sharon Academy teaches this unit because it is a topic very close to us, and an issue in our society that we will need to find a cure to, whatever it may be. While we may be only young teenagers, in this unit we were informed that even the smallest voices can make a difference. Just by choosing free-range chicken instead of factory farm makes a change in the way we eat our food. We've created this newsletter to spread the word, and inspire you to change your eating habits and think of what you can do to help solve the seemingly endless issue of world hunger.

While writing this reflection, I thought a lot about what it would be like to work or live in a city experiencing starvation, such as Mumbai, India. Learning about this topic really helped me create an idea for what I want to do once I graduate from high school and beyond, and it motivated me to look into what would need to be done to end world hunger. We have enough food on this planet; we've got plenty. It's just an issue of wasting good food. Thanks to this unit and this newsletter, I've begun to track the amount of food I waste, and I've attempted to bring down that amount drastically.

In science, I learned how to take advantage of the abundant sources of fresh fruits and vegetables in Vermont and lead a heavily plant-based diet, which is not only better for me, but the planet as well. In Language Arts, I began to understand the Irish potato famine much better when we read *The Irish Dresser*, a book about an Irish family experiencing starvation and emigrating to America in hopes of leading a better life. Finally, in Social Studies, the class where we worked on and created our articles, I learned more and more about factory farming, and what really goes on inside the windowless walls of a Concentrated Animal Feeding Operation processing factory. This newsletter opened my eyes to the real issues going on in the world around me. Being the editor-in-chief, I not only enjoyed reading the other articles my peers had written, but also being able to learn about other topics besides my one article. This food and hunger unit has inspired me, and I'm sure it has done the same for many of my peers. I hope our work can inspire you as well.

– Lowry Newswanger

## Where Did Your Burger Come From?

Joseph Thibodeau

Did you know that the U.S. alone consumed 24.8 billion pounds of beef in 2019 (Shahbandeh)? This much beef weighs the same as almost 7000 cars. The beef industry has several issues and concerns involving the workers and cattle. The cattle are fed a corn diet and are kept in cramped conditions. The workers aren't paid well and work in unhealthy conditions. Most consumers who eat beef from factory farms don't know where it comes from. How is beef produced, and what are some of the issues with the beef industry?

One issue in the beef industry is that many cattle are raised in Concentrated Animal Feeding Operations (CAFOs) which can have a negative impact on cattle. There are 500 cattle per acre in a CAFO (Lynch). Cattle raised on CAFOs are sometimes denied access to outdoor vegetation or shelter. The cattle are fed corn because it is cheaper and it fattens them up faster, but it can also cause digestive problems. Cattle are not evolved to eat corn, and when they do, it creates digestive problems. The rumen is designed to eat grass. As author Michael Pollan explains, "You start giving them antibiotics, because as soon as you give them corn, you've disturbed their digestion, and they're apt to get sick, so you then have to give them drugs" (Interviews). This is how antibiotics get into the meat. Digestive troubles from eating corn make the cattle stressed and more vulnerable to all types of diseases. They suffer from bloating and stop ruminating (Interviews). Cattle are fed corn because it makes them grow faster and quickly fattens them. This diet of corn and the use of antibiotics are significant problems because they create a lot of stress for the cattle and negatively affect the nutritional quality of the meat.

CAFOs also impact the environment because they produce a significant amount of waste and pollution. CAFOs produce 42% of agricultural emissions from the cattle passing gas and burping (Friedman). CAFOs can produce 2,800 to 16 million tons of manure a year. "Large farms can produce more waste than some U.S. cities—a feeding operation with 800,000 pigs could produce over 1.6 million tons of waste a year. That amount is one and a half times more than the annual sanitary waste produced by the city of Philadelphia, Pennsylvania" (Hribar). On traditional farms, cattle manure fertilizes the soil, but at CAFOs, there is too much manure in a small area, it doesn't fertilize the soil; it just turns into sludge. When it rains the sludge runs off into waterways and contaminates surrounding soil.

Another issue with the beef industry is that the conditions on CAFOs are not safe for workers. Workers can be

# CAFOs' Impact on the Environment, Animals, and Communities

Arya Flanders

Did you know that on any one individual CAFO farm there can be from 2,800 tons to 1.6 million tons of manure a year (Hribar)? A CAFO is a Concentrated Animal Feeding Operation, otherwise known as a factory farm. CAFOs and AFOs (Animal Feeding Operations) became one of America's main sources of meat in the mid-1970s due to the rising demand for meat and poultry (Hribar). Right now, there are roughly 15,500 CAFOs in the US (Gurian-Sherman). The practices of CAFOs are controversial because Americans eat, on average, "222.2 pounds of red meat and poultry a year" (Durisin) and 99% of that meat comes from a factory farm (Skowron). What are the concerns about CAFOs and how are they linked to animal abuse?

One issue with CAFOs is that they aren't environmentally friendly. The smallest CAFO can produce waste equivalent to what 16,000 humans can produce (Why). CAFOs apply the waste to a small area of land so often that it eventually stops decomposing. CAFOs make too much waste for the land to absorb. When it rains all of the manure on the top of the pile runs off into the surrounding water. Animal waste can carry diseases such as salmonella, E.coli, and cryptosporidium, which can spread into the water (Why).

In addition to polluting the water, CAFO manure emits dangerous gasses like ammonia, hydrogen sulfide, and methane (Why). Before being put on the fields, manure is stored in pits underneath the floor of the barn, where it cannot be exposed to oxygen. These manure gasses rise through the floor, causing air pollution that could kill the animals and the workers inside CAFOs if the fans ever stopped working. Even when properly ventilated, the fumes still contaminate the surrounding communities. "Some people develop breathing problems, coughs, headaches, hydrogen sulfide poisoning, and ammonia poisoning" (Why).

In addition to giving off poisonous fumes, all of the animal's food has antibiotics in it to make sure they don't get diseases (Animals

on). When antibiotics are put into food, the livestock develops antibiotic-resistant bacteria. That bacteria pass through their meat and manure into the environment. Neighbors can become sick due to the antibiotic-resistant bacteria in the animals' meat and in the water surrounding the manure piles.

CAFOs are also a concern because they have been linked to animal abuse. Most of the animals in a CAFO never see sunlight or breathe fresh air. All of the animals live with fumes that are dangerous and could kill them. The breeding animals are kept in small pens while they're pregnant and then they give birth in equally small spaces. They are artificially inseminated and then go back in the tiny pen (Animals on). Breeding animals spend most of their lives pregnant. Animals in CAFOs also get parts of them cut off without painkillers, such as tails, horns, and beaks, etc. because they can get cannibalistic due to stress. Chickens raised on CAFOs live in large sheds with at least 20,000 animals packed together (Animals on). The animals are also slaughtered very inhumanely. For example, some of CAFOs methods such as being frozen, beaten, or bled to death (Animals on). Humane slaughter is when you stun the animal so that it is unconscious and then its throat is slit (Humane). Many activists think that CAFOs should be regarded as animal abuse because of how they treat their animals and slaughter them.

Another concern is that the working conditions inside the CAFOs have been known to prompt the workers to abuse animals. The workers suffer from many medical problems "including repetitive motion injuries and respiratory illness" (Imhoff). The workers have to work with all of the fumes that the animals have to live with, such as ammonia and hydrogen sulfide gases (Factory). Most of the time workers aren't allowed to go to the bathroom, so they just go where they stand (Lowe). Many of the workers also work 12-hour shifts (Lowe). Since the working conditions in CAFOs are so poor, workers

can sometimes start to be abusive towards the animals.. Animal rights activists think that the animals in CAFOs need rights to protect them.

Proponents of CAFOs argue that consumers shouldn't be concerned because CAFOs are regulated, however, these regulations are limited. The National Pollution Discharge Elimination System (NPDES) permit regulates CAFOs (Animal Feeding). The NPDES "limits the amount and types of pollutants that can be released" (Farquhar). It mostly limits what large companies can put into the United States water (Animal Feeding). The permit requires CAFOs to make a Comprehensive Nutrient Management Plan (CNMP) (Unified). "A CNMP contains records of the current activities on a livestock operation, and evaluation of the existing environmental risks, and proposals to reduce the risk of negative impacts on the environment" (Conservation). In 1993 CAFOs were subjected to random tests for E-coli in their meat, however, this practice doesn't happen anymore due to all of the opposition against it from the meat industry. In 1996, CAFOs and meatpacking companies were tested for salmonella, and if they failed the USDA had the power to shut them down. However, in 1999 the Supreme Beef Processors sued the USDA and by 2001 the Supreme Beef Processors overturned the USDA's power to test for salmonella. Now the USDA's power is very limited (Imhoff 119-120). CAFOs are regulated under the NPDES permit which requires them to make a CNMP so that the government can keep an eye on their environmental impact.

While alternatives to CAFOs cost more, they could solve some of the aforementioned problems. Pigs could be raised in hoop barns (barns with a curved roof and open ends). With this barn, pigs are able to root. "In one test, hogs raised in hoop barns in North Dakota provided 6.63% higher net income per pig than conventional confinement" (Gurian-Sherman). This shows that more money

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# Food Insecurity and its Root Causes

Farren Stainton

For 59,000 Vermonters, where their next meal is coming from is an uncertainty. Food insecurity is an issue globally, but often people fail to realize that it's also affecting many people here in Vermont. Food insecurity is when someone is unable to consistently access or afford adequate food (Food Insecure). Being food insecure can be hard to overcome and can cause life-threatening diseases, like heart disease (Health). In Vermont, 10% of people experience food insecurity, and 15% of children suffer from food insecurity (Hunger). The majority of people in America (51.4%) who experience food insecurity experience it before the age of 60 (Who). In addition, the percent of food insecurity in Vermont has increased by 6.1% in the last 10 years (Schattman). In order for Vermont to end food insecurity, it is important to understand who is impacted by food insecurity in Vermont and why?

Children in Vermont are at a higher risk of food insecurity. They are dependent on other people to care for them and provide them food. Their bodies are in a demanding stage of life where they need a lot of food to help their bodies and brains grow (Who). If their parents don't have enough money to buy food for them, they will not eat well or know where their next meal will come from. According to Hunger Free Vermont's statistics, "17,726 Vermont children under the age of 18 live in food-insecure households (15%). Children living in food-insecure households are at a greater risk for poor health, nutritional deficiencies, and obesity/overweight, as well as developmental delays, poor academic achievement, depression and increased aggressive or hyperactive behavior" (Hunger). Children need nutritious food most because without it they can experience lifelong developmental delays. These childhood delays can impact them as adults since not being able to focus on school and other consequences of improper nutrition can impact the kind of job they can get when they grow up. This may send them down a spiral of food insecurity for their

whole life.

Lack of education can lead to food insecurity. People who do not attain an education are more likely to be food insecure because they do not possess the expertise or credentials to obtain a well-paying job. According to the Social Security Administration in 2015, "men with a graduate degree earned more than \$1.5 million in lifetime earnings more than those with just a high school diploma...Women earned \$1.1 million more" (Longley). Obtaining higher education makes a person more likely to compete for a higher paying job and therefore earn more money. Lower-income individuals who lack education can have a harder time making the money needed to buy nutritious food.

Not only are many people without an education affected by food insecurity but, people in poverty and low-income families are also affected. People in poverty and low-income families are affected by food insecurity because they do not make enough money to buy healthy and sufficient food. A common misconception is that the issue of food insecurity exists because our country is not producing enough food (Who). However, the reality is that people in poverty or those who classify as low income can have trouble affording the daily cost of living while still paying for food. It costs 16% more to live in Vermont than the national average (Woods). In addition, "groceries are 11% higher, health costs are... 5% higher, housing is 27% higher, utilities are 29% higher, and transportation is 7% higher" (Woods). This shows that Vermont is more expensive to live in than most of the country, and with all of these extra costs, it can become even harder for people to find enough money for food. The Vermont minimum wage is \$10.97 an hour as of the start of 2020 (Press). However, according to a study done by the Vermont legislature, "the living wage in Vermont is for a single adult living in a rural area is \$13.34 an hour" (Vermont Legislative). If people are only being paid minimum wage, they will likely find it challenging to pay for all

of their living expenses and buy food.

Many people in Vermont grapple with food insecurity because they live in food deserts and may lack reliable or affordable transportation. The definition of a food desert is "an area where little fresh produce is available for sale" (Food Desert). Living in a food desert also means someone is ten or more miles away from food. In this situation, if a person lacks transportation it can be almost impossible to access fresh produce. Vermont is especially a food desert during the winter months because there is little in-season produce. Icy winter road conditions in Vermont can make it hard to access food, especially when many individuals have to go ten or more miles away to access fresh food. Furthermore, transportation is expensive so, it can be hard to afford if residents cannot access a job. In Vermont, many more people live in food deserts because of the rural nature of the state. According to the State of Vermont Agency of Transportation in 2019 gas in Vermont had an average cost of \$2.56 a gallon (Fuel). Considering how much gas is used in cars, it can be difficult to afford gas and food. For a single person "In rural Vermont transportation costs about \$516 a month or \$6192 a year" (Vermont Legislative). For a 45 hour workweek at a minimum wage of \$10.97 an hour (Press), the individual would earn \$493.63 which wouldn't be enough to pay for their transportation costs alone. Finally, few regions possess public transport, which means that if food insecure people do not live in one of these places, there's no way for them to access a store for food.

The Supplemental Nutrition Assistance Program (SNAP) is a program to help people who are food insecure. However, users often have trouble affording healthy food. The "average monthly SNAP benefits for October 2018 through July 2019 [were] \$262 per household and \$132 per person" (A). However, the Vermont Legislature estimates, the total cost of food for one person a month as being \$312 (Vermont Legislative). If someone relies



# Colony Collapse Disorder: Why Honey Bee Death Affects Us

Amara Fuchs

Imagine your shopping list. Does it include almonds? Blueberries? Tomatoes? Apples? All of these, along with hundreds of other fruits and vegetables, rely heavily on honey bees for pollination. And according to an article for *The Balance*, honey bees will be extinct by 2035.

The reason for this decline in honey bees is Colony Collapse Disorder (CCD), an issue that has been plaguing honey bee hives and beekeepers all over the world for the past 15 years. CCD occurs when worker bees leave the hive and can't find their way back, leaving the queen, some younger bees, and stored pollen behind. Though the remaining bees are fine at first, eventually they run out of food, and that's when the colony collapses. Though its effects are widespread, CCD only affects the European honey bee, *Apis Mellifera* (also called the Western honey bee), which has become naturalized all over the world.

Though no one is entirely sure what causes CCD, it is generally agreed that it is a combination of factors, including pesticides, parasites, pathogens, lack of pollen, and stressful beekeeping practices. Studies show that chemicals used in crop fields can significantly and negatively impact bees' immune systems, and do nothing to stop the parasites and other problems that cause CCD. According to economic analyst Kimberly Amadeo, "Bees pick up the chemicals through dust and residue on nectar and pollen . . . As a result, they are more susceptible to the parasites." These parasites are *Nosema ceranae*, *Nosema Apis*, and *Varroa destructor* (Hood). *Varroa destructor* (also called the varroa mite) is capable of carrying several deadly diseases, which also contributes to the collapse of bee colonies. But how does this issue affect the economy and environment, and what is the best solution for stopping it?

Colony collapse disorder affects the economy because a lot of U.S. agriculture depends on honey bees for pollination. According to Amadeo, "The Western honey bee is the world's premier managed pollinator species."

Honeybees in the U.S pollinate over 90 crop types, including many fruits and vegetables (Hood). On average, a third of the foods consumers eat are affected in some way by honeybees. "Colony Collapse Disorder also affects the beef and dairy industries. Bees pollinate clover, hay, and other forage crops. As they die off, it raises the cost of feedstock. That increases the beef and milk prices at the grocery store," Amadeo adds. Since honey bee pollination plays such a significant role in agriculture, local farms are losing money as bees become rarer and more expensive. If this process continues, it could increase food imports from countries that are CCD free, which would raise the U.S. trade deficit and the price of food for American consumers. Some crops might even disappear, like almonds, which rely 90% on honey bees for pollination (Amadeo). All of this will affect the economy and consumers around the country.

Colony Collapse Disorder affects the environment because honey bees are one of the most important pollinators in ecosystems around the globe. In an experiment to see whether other species of bees would take over pollination if one species disappeared, scientists found that some plants suffered from other bees picking up the slack. Because bees that used to pollinate only one species now visited several, plants that required their own pollen to reproduce got pollen they couldn't use. Author James Gorman states that plants made 30% less seed than usual as a result of this dilemma. Also, according to researcher Kathleen Wong, "Honey bees are the world's most important single species of pollinator in natural ecosystems . . . One out of eight interactions between a non-agricultural plant and a pollinator is carried out by the honey bee." Since bees are a major natural pollinator and the loss of one can severely impact plants' ability to reproduce, CCD and honey bee loss could have a devastating effect on natural ecosystems around the country.

One potential solution for CCD is banning

chemical pesticides, because pesticide use on farm crops negatively impacts honey bee health. Even so, there are many pros and cons to eliminating pesticides. For one, if farmers follow this method to save honey bees, they would also help other animals who are also threatened by pesticide use. Amadeo explains that, ". . . pesticides are responsible for bee colony collapse. They also negatively impact many birds and other wildlife." However, the pesticides that are the most dangerous to bees, neonicotinoids, are common because they work well, so farmers might not be willing to give them up. Almost 4 million pounds of these pesticides are used on less than 200 million acres of land a year (Amadeo).

Another potential solution for CCD is using prevention materials like antibiotics to protect bees against the causes of the disorder. Entomology professor Mike Hood explains that some beekeepers have recommended using antibiotics to prevent infections from *Nosema* fungi and using fumigants to stop varroa mites. Though these materials cost money, replacing lost hives costs beekeepers too. Amadeo reports that "Over the last six years, the bee industry spent \$2 billion to replace 10 million hives." To compare, bee antibiotics for a colony cost under \$25 per year, and are very effective on the fungi that cause CCD (The 'Nosema Twins'). However, some of these substances are dangerous for people and can't be used on bees that make honey for human consumption without risks of disease and birth defects.

Some ways the public can help prevent CCD include lobbying the government for stricter pesticide laws and growing pollinator-friendly gardens. According to the U.S. Department of Agriculture, "Insufficient or incomplete nutrition has come to be recognized as an essential factor that weakens the honey bee's immune systems and is likely to make bees more susceptible to all of the other problems troubling them today" (ARS). The department also says that a solution to this

# Good Morning! Who's Really Paying for That Coffee?

Esme Krauthamer

Do you know where that frappuccino really came from? Most Americans couldn't live without their morning coffee, but how does a little red berry in Peru get to a Starbucks in New York? And why are Americans paying \$4.45 for a drink while farmers only make 1 or 2 cents from it (Maasho)?

Millions of people drink coffee in America. However, that coffee didn't just appear on store shelves. The US buys over 3,351,379 pounds of coffee per year (World), most of which comes from Brazil, Honduras, and Columbia (Coffee). Eighty percent of the world's coffee comes from smallholder farms, and more than 125 million people worldwide depend on coffee for their livelihoods (Macksoud). These people could lose their income if market prices for coffee fall, while large corporations like Nestlé still profit. There is also the planet to consider. Growing, producing, and shipping coffee can be very detrimental to the environment, and farmers in developing countries are often hit hardest by the effects of climate change. Coffee may be essential to Americans' mornings, but is the coffee industry sustainable for the producers and the environment?

Many farmers have a hard time breaking even, and coffee growing is not a very sustainable income, especially in a bad year. Corporations often exploit coffee growers and pay much less than retail value for the coffee they produce. Corporations such as Nestlé want to buy coffee as cheaply as they can, in order to sell it at market value in the United States and make the highest profit. Retail price for coffee in the US is \$5.45 a pound (Retail), but some years the actual producers have been paid as little as 7 cents a pound (Macksoud). Small farmers who rely on coffee for their income have very little bargaining power, so they're at the mercy of the more powerful companies. This system is not sustainable for the coffee farmers, because if the retail price falls, they won't be able to make as much money for their coffee.

In most cases, coffee is grown as a mono-

culture. If farmers only grow coffee, they are at risk of losing their income if the market crashes or the crop fails. For example, in 2007 coffee prices dropped, and more than 125 million people fell into poverty. Families couldn't afford food or cover the cost of living, and millions of children dropped out of school (Macksoud). In Ethiopia, researchers estimate that there are more than 320,000 hectares (790,737 acres) of coffee trees (Mutua). Most of that land produces only coffee, so no other crops are grown nearby and the plants are more susceptible to disease because they spread more easily in a monoculture.

Producing coffee can also drastically impact the environment, and coffee farmers are often hit hardest by climate change. Coffee is grown and processed using different methods, some of which can be very detrimental to the environment. For example, the wet method is the most popular and effective way of processing coffee. Using this method, the pulp is separated from the cherries as soon as they are harvested, and the beans then pass through metal drums where they are separated by weight, and then fermented in steel drums for 12 to 48 hours. Before the process is complete, the beans have to pass through more water channels to be rinsed, and then dried (National). The downside of using the wet method is that it produces a lot of waste, which is expensive to dispose of after production. Moreover, if it isn't properly dealt with it can be very harmful to the people and the environment. Around 40 percent of the cherry is pulp, which has to be removed before the coffee is dried and roasted. Farmers often just dump this waste in nearby waterways, and as the biomatter decomposes, it sucks oxygen out of the waterways, making them toxic for fish and wildlife, and useless for coffee processing in the future. This wastewater can also be very toxic for humans, and many people living near coffee processing places experience eye and skin irritation, dizziness, nausea, and breathing problems (Chandravanshi).

The wet method of processing coffee is not

environmentally sustainable, and it can harm nearby ecosystems. Most farms do not have the financial incentive to deal with the waste, and the dry method, the only other way of processing coffee, is not a workable alternative. Using the dry method involves leaving the beans out to dry in the sun, which leaves them vulnerable to weather conditions and is too much of a risk for farmers.

Shipping coffee can also be detrimental to the environment. Transporting it by boat or plane creates a lot of carbon emissions, which are not environmentally sustainable. Americans buy coffee mostly from countries like Brazil, almost 5,000 miles from the US. Transporting food across continents takes a lot of fuel and creates a lot of emissions, but fuel for carrying goods internationally is not taxed (Rosenthal). This tax loophole creates an incentive to ship goods over long distances, which harms the environment. As Paul Watkiss, an economist at Oxford University explains, "We're shifting goods around the world in a way that looks really bizarre... [W]e are not paying the environmental cost of all that travel" (Rosenthal). The lack of taxes on international fuel means that companies are shipping coffee internationally more than ever, and the emissions that are created are terrible for the environment.

However, this is not to say that there is no sustainable way to produce coffee. For example, the traditional way of growing coffee in full sun is not sustainable, but many farmers are switching to the more environmentally friendly shade-grown coffee. Coffee grown in full sun is unhealthy for the land because nothing else is growing there. It also requires more fertilizer and pesticides, which also makes it more expensive for the farmer. On the other hand, shade-grown coffee supports a much more stable ecosystem, doesn't require pesticides, and is considered higher quality coffee (Anand). Shade coffee plantations also provide an excellent habitat for birds, which increase production by eating pests (Anand). Shade-grown coffee creates much more biodi-

# The Life of an Orange

Justin Wylie

A dangerous pesticide called chlorpyrifos has been linked to damaged brain development in children and reduced brain function in adults. In a study done by HEAL, Chlorpyrifos was found on one out of four oranges (New). Oranges are largely grown in California, Texas, Israel, Spain, Morocco, and parts of South Africa (Petruzzello). Oranges do not ripen after being picked, unlike many other fruits, so they have to be picked when they are ripe (Petruzzello). The orange tree bears fruit for approximately fifty to eighty years (Petruzzello). In 2019, the US alone consumed 1,251,000 metric tons of oranges, with the entire world consuming 28,657,000 metric tons (Custom). All of this orange production begs the question, what are the various processes that an orange undertakes before it reaches the shelf, and how can they affect the consumer?

One process that can affect the consumer is the application of pesticides. Some compounds can be harmful to pests and are also harmful to humans. One example of this is the pesticide, chlorpyrifos, which has been linked to damaged brain development in children, causing them to be “smaller, have poorer reflexes, and show higher risks of having ADHD and other developmental disorders years after being exposed” (Hu). It has also been linked to decreased brain function in adults. Methidathion is another pesticide that is used on oranges. Methidathion is “suspected of causing cancer, and can also cause stomach pains, diarrhea, vomiting, and nausea” (Geoffrey). One should be careful about what pesticides are used on the oranges we consume, so as to make sure that we are not consuming any harmful chemicals. Washing the fruit may not work, as some of the pesticides are designed to be absorbed by the flesh of the fruit, so as to further deter pests.

Another process that can impact the consumer's health is the application of additives to orange juice. This is because some additives, like certain preservatives, are harmful to the body. An example is a preservative called

sodium benzoate. Sodium benzoate has been linked to chromosome break (Pongsavee), which can lead to severe distortions in the DNA, and cancer. Another preservative in orange juice, sodium metabisulfite also has negative health effects (Akinola). In a study published by Folia Biologica, Sodium metabisulfite was given to rats. The study found that the volume and length of the capillaries in the heart were reduced. (Noorafshan). Because of this, it would be beneficial to limit the consumption of orange juice that has been treated with these chemicals, such as orange juice that is produced in a large-scale orange juicing operation. However, freshly squeezed orange juice is not full of preservatives and is a healthy source of Vitamin C.

One essential part of getting oranges to consumers is the process of harvesting the oranges. It is much more efficient to harvest oranges in an organized way. There are various modes of orange harvesting, including picking (mostly done by immigrants, whether with a special visa (Charles) or undocumented (Block)). There are also canopy shakers. These are large machines with two padded prongs that grip the tree, and then shake it, causing most of the fruit to fall (Orchard). The immigrants with special visas, called H-2A, are provided with free lodging and transportation. After the oranges are picked, they travel to a plant, where they are either juiced or packaged.

Another process in the orange industry is juicing. First, the fruit is unloaded and put into a bin for grading. After this, the oranges are put into a storage bin and washed. After this, they are graded again and sized. Once they have been graded, they are put into a juice extractor. If the juice is going to become concentrated, it is first put into a finisher (which helps remove undesirable aspects from the juice (Petruzzello)). Next, It is put into a centrifuge and pasteurized. Pasteurization is the process in which a fluid is heated up to eliminate bacteria. After pasteurization, it is either put into frozen aseptic storage or into

large refrigerated tanks. (Ringbloom).

A final process in the orange industry is for packaging picked oranges. Businesses need to have a reliable procedure to make sure that every bag of oranges is similar and to produce them quickly and efficiently. If the oranges are still a bit green, they are put into a green-ing room, where they are sprayed with ethylene. Because oranges do not ripen once they are picked from the tree, the ethylene makes the peel turn orange, and does not ripen the fruit (Crivelli). Next, they are dumped into an initial packing line and rinsed to get rid of debris and leaves. After this, they are conveyed into a black lightroom where the black light helps workers sort out the moldy fruit. The oranges are washed and dried and then waxed. Again, the oranges are hand sorted and go into a second black lightroom to look for more mold. They are machine sized, sorted by color, and then transported to the correct packing conveyor belt. There is one final hand sort before packing (Crivelli). Oranges are made to look attractive to the consumer because people do not like to eat ugly food. The oranges are sprayed with a chemical that makes them the nice orange color that we are used to. In reality, they are green, or sometimes green and yellowy-orange, even when they are ripe. They are waxed as well, to add to the appeal.

There are many processes that oranges go through to reach the consumer. Some of the steps involve chemicals that are not always beneficial to consumer's health. Pesticides and additives in orange juice can impact the health of the consumer, and that there is a process of picking, packaging, and juicing oranges. Consumers should know about the processes their food goes through, and how it affects them. This way, the consumer can make more informed decisions about what to buy. Some questions that remain after doing this research are: Are there sustainable ways to do large scale agricultural growth without using large amounts of pesticides?

# How the Connections Between Poverty and Obesity Can Cause Long-lasting Issues

**Makayla Nichols**

Did you know that in America 37% of women and 35% of men are obese (70%)? People with low incomes often have trouble affording healthy and nutritious foods since they are typically more expensive than unhealthy foods. Eating foods that may be cheaper but also high in sugar and fats can result in diabetes and obesity, which can lead to other medical issues that require expensive medical care. By understanding the ways in which poverty and obesity are related, we can figure out how to try to reduce them.

One way poverty and obesity are related is that unhealthy foods are cheaper because of government subsidies. A government subsidy is when the government gives money to a certain business, so they can make more products at a reduced price. The government subsidizes crops like corn, soybeans, wheat, rice, dairy, and livestock (Anahad). Since these crops are subsidized, they are produced in larger quantities and farmers are guaranteed income from the subsidy. The abundance of subsidies leads these ingredients to be used in more foods since they are the cheapest. These ingredients are used in unhealthy foods making them cheaper. For one person to eat a healthy diet, it would cost them \$550 more per year to eat than eating unhealthy food, that's \$1.50 more per day (Eating). For people of low income, they may have no choice but to buy these unhealthy foods if they cannot afford to pay an extra \$1.50 more per.

Another reason why poverty and obesity are related is that the Supplemental Nutrition Assistance Program, SNAP (or food stamps), doesn't always provide enough benefits for people to afford a healthy diet. SNAP provides financial support for people who have a low income. However, many people struggle to be eligible for the program. To be eligible for 3SquaresVT (Vermont's food stamp program), one's gross household income must be equal to or less than, 185% of the federal poverty income level. However, an individual's

gross household income can be over 185% if their household includes someone 60 years or older, or somebody with a disability. The average person who receives SNAP benefits gets \$123.00 per month, which is only \$4.10 per day. While SNAP is helping people afford baseline food, it's not enough to afford a healthy diet.

Another way poverty and obesity are connected is the fact that eating unhealthy foods doesn't make the consumer feel full, because these foods lack important nutrients. Have you ever eaten a whole bowl of potato chips and still felt hungry after eating them? That's because of something called satiety. Satiety is the mechanism that stops a person from eating more when they don't need it. A satiety level is measured by the ratio of nutrients to calories, so when foods that we eat do not have a lot of nutrients, the food moves faster through our bodies, making the feeling of fullness fade faster. When people cannot afford healthy foods they are forced to eat cheap foods that have low nutrition and that leads to overeating due to lack of satiety (Severson). Overeating is one of the main factors in obesity.

Another way that poverty and obesity are connected is that the products available at food shelves are not always healthy and nutritious. The foods available at food shelves depend upon what people donate. According to Mary Stoddard, who runs the food shelf in Sharon, the foods that run out quickly are bread, pasta, rice, meat, and canned vegetables. They often do not have a lot of cheese, butter, spices, yogurt, and fresh milk, there are not many dairy products available. Getting enough dairy is important because it provides a lot of essential nutrients. Canned vegetables are easier to stock and last longer. A lot of the time canned vegetables get salt, sugar, and preservatives added to them throughout the canning process making them less healthy than fresh produce. Fresh produce is packed

with more nutrition. (O'conner).

Poverty and obesity are also related in that obesity-related health costs are expensive and paying for them makes it hard for people to have enough money for healthy food. People who are obese have a higher risk of developing diabetes. In 2010, \$190.2 billion (21%) of annual medical spending was spent on diabetes. Children's diabetes alone was \$14 billion in direct medical costs (National). Insulin (diabetic medication) used to be \$100 to \$200 but has risen to \$400 to \$500 per month, depending on the brand (Dorsey). If the diabetic who is buying the medication does not have insurance, then all of that money must come out of pocket. Lack of money for healthy food is causing these health problems. When these people have to start paying for expensive medications, it creates a cycle of choosing medication or healthy food.

There are complex connections between poverty and obesity. The high cost of healthy nutritious food, health care costs, and the limits of food assistance are all interrelated. Despite the challenges of addressing these issues, a good place to start is by donating healthy foods to your local food shelf. If you have a few extra cans of vegetables sitting in your pantry or some extra garden veggies, donate them so the people who will eat them can. While there are small actions everybody can do to reduce food insecurity, there are also larger-scale solutions. Providing low-cost health care would help solve the problem of people choosing between medication and nutritious food. Similarly, if the government-subsidized fruits and veggies instead of highly processed foods, low-income individuals would be able to afford healthier options with their limited funds. We can try to make these larger changes by discussing these issues with family members, spreading the work in your community, and voting for politicians who support policies that will end food insecurity.



# Is Pizza a Vegetable?

Justin Luce and Pam Ward

What do you think of when you hear the word “vegetable”? Carrots? Spinach? What about pizza? In 1946 President Harry Truman signed into law the National School Lunch Act to provide nutritionally balanced food to low income students (National). The act assumes that to get the right amount of nutrients students should eat on average two cups of vegetables per day (Potts). To help meet this average daily value the National School Lunch Act decided that school lunches should provide 3¾ cups of vegetables per week. They also stated that ¾ of a cup of this serving should be red and orange vegetables to provide students with a variety of vegetable types.

In 2011 Congress decided to count a ¼ cup of condensed tomato paste as a ½ cup of vegetables towards this red and orange vegetable requirement. President Obama, who was concerned about childhood obesity and nutrition, tried to change this and have a ¼ cup of tomato paste count as a ¼ cup of vegetables, but this was overturned by Congress (Kliff). As it stands now, a slice of pizza containing two tablespoons of tomato paste (1/8 cup) counts as a ¼ of a cup of vegetables which is 1/3 of the weekly requirement for red and orange vegetables. There are many people who feel that this is a faulty way to make sure that children are getting their vegetable requirements. How can pizza, which is served for school lunches, be classified as a vegetable?

One argument in support of considering pizza a vegetable is that tomato sauce is packed with a lot of vitamins, minerals, and fiber because it is made from tomatoes, which are a vegetable.

However, even though tomato paste is nutritious, it is tricky to count pizza as a vegetable because there are many varieties of tomato pastes and sauces used on pizza. The concentration of the tomato in the sauce or paste determines the daily value of vitamins, minerals and fiber in a serving. The following is a comparison of the vitamins and minerals in a one cup serving size of tomato paste compared to one variety of tomato sauce (Eat).

INGREDIENTS	TOMATO PASTE	TOMATO SAUCE
Iron	7.8 mg	2.4 mg
Potassium	2,656.7 mg	727.7 mg
Sodium	154.6 mg	27 mg
Magnesium	110 mg	36.8 mg
Zinc	1.7 mg	5mg
Vitamin A	199.1 ug	53.9ug
Vitamin C	57.4 mg	17.2 mg
Vitamin E	11.3mg	3.5 mg
Vitamin K	29.9ug	6.9ug
Thiamin	.2 mg	.1mg
Riboflavin	.4mg	.2mg
Niacin	8.1 mg	2.4 mg
Pantothenic Acid	.4mg	.8 mg
Vitamin B6	.6mg	.2 mg

(Nutrition)

The evidence shows that for every nutrient, the tomato paste has at least double the nutritional value of tomato sauce. Tomato paste is more concentrated and thus has a lot more nutrients per serving than tomato sauce. When the sauce is boiled down to make a paste, it loses water and becomes more concentrated with vitamins and minerals. Tomato paste is the most concentrated version of tomato sauce, so the vitamin and mineral values are the highest per serving. When pizza in a school lunch claims that there is a quarter cup of tomato sauce on a slice of pizza, the concentration of tomatoes in the sauce is not clear unless they state whether they have used tomato paste or sauce. A school that uses paste will have a more nutritious pizza than a school that uses tomato sauce.

Another concern with counting pizza as a vegetable is that some tomato sauce has added sugar which makes the sauce higher in calories (Tarantino). Also, canned tomatoes often have added high fructose corn syrup (Impatenco). If canned tomatoes have been added to the sauce, then it is possible that high fructose corn syrup has also been added, again increasing calories (Impatenco). Increasing the calorie count per serving is a problem for children fighting obesity. Childhood obesity is a serious problem in the United States put-

ting children and adolescents at risk for poor health. For children and adolescents aged 2-19 years, the prevalence of obesity is 18.5% and affects about 13.7 million children and adolescents (Childhood).

Depending on which brand of tomato paste is used, pizza can be more or less healthy. When comparing three tomato sauces it is easy to see the differing amounts of calories, sugar and fat. The sugar content ranges from 6 to 9 grams of sugar, which is the same amount as two Oreos. The calorie amount ranges from 45 to 90. There can be 1 to 4 grams of fat. (Nutritio) Since sauces vary in the amount of sugar, fat, calories, also the brand of sauce being used will affect whether pizza is a healthy way for students to get a serving of vegetables. unless they use plain undiluted tomato paste, sauce as a “vegetable” could add unnecessary sugar and fat (Tarantino).

Another problem with counting pizza as a vegetable is that the tomato sauce on pizza is combined with other ingredients that are less healthy. Other ingredients add such as bread, cheese and processed meat toppings add more fat, carbohydrates and calories. “Pizza is the second highest reason that obesity occurs in America. Kids ages 6 to 19 years old consume 22% of their daily intake of pizza. This was from 2003 to 2010. Pizza was ranked as the second highest contributor to children’s solid fat intake from schools and fast-food restaurants” (Sifferlin). Common ingredients in pizza are white flour, which provides 400 calories and 92 grams of carbohydrates per cup, and mozzarella cheese, which provides 70 calories, 5 grams of fat, and one gram of carbohydrates per ounce (Sifferlin). When the vegetable serving is embedded in pizza, it teaches kids to eat their vegetables surrounded by high calorie foods. It doesn’t give them the experience and the taste for eating plain vegetables.

How can pizza which is served for school lunches be classified as a vegetable? Pizza itself will never fully be a vegetable because of all the other ingredients surrounding the tomato-based part of the pizza. Nevertheless, the sauce, under some circumstances, can actually be a fairly nutritious vegetable. As long as

# Throwing Away Food Makes Methane Gas?

Eli Huntington

Did you know when you throw away your food you create a gas with twenty-one times greater impact on global warming than carbon dioxide? In America, there is a significant problem with food waste. Americans throw away 1/3 of the food grown in the U.S.. One reason is that consumers don't like "ugly" food. Most food waste is from farmers throwing away food that doesn't look good enough for the supermarket. Farmers and consumers are affected by food waste because it contributes to global warming. Food waste in America is appalling when there are so many hungry and food-insecure families. "The U.S. is a significant contributor to world food waste producing 60 million tons of excess food every year. The U.S. produces more than enough food to feed everyone in the country but much of it is disposed of" (FDA). Why does food get wasted and how can we reduce it?

Chain restaurants tend to waste more food than smaller restaurants because they serve larger portion sizes than small-scale restaurants. U.S. restaurants generate an estimated 22 to 33 billion pounds of food waste each year (FDA). Institutions — including schools, hotels, and hospitals — generate an additional 7 to 11 billion pounds per year (FDA). Approximately 4 to 10 percent of the food purchased by restaurants is wasted before reaching the consumer (FDA). Drivers of food waste at restaurants include oversized portions. According to the Cornell University Food and Brand Lab, on average, diners leave 17 percent of their meals uneaten and 55 percent of edible leftovers are left at the restaurant (FDA). This is partly due to the fact that portion sizes have increased significantly over the past 30 years, often being two to eight times larger than the USDA or Federal Drug Administration (FDA) standard servings (USDA). If restaurants reduce the food portions served to consumers, it could cut down the amount of food waste in a significant way. While portion sizes differ at small-scale

restaurants the portion sizes in the chain restaurants are the same. If chain restaurants use smaller portion sizes they could make an impact on food waste in the U.S.

Another reason food is wasted is that farms can't sell second's, or "ugly food" to stores. If people were able to get over the fact that they can eat their food even though it is ugly or bruised, we would cut down on a vast portion of our food waste in the U.S.. Americans waste \$165 billion worth of food each year (New York Times). One in four calories produced is never eaten (USDA). Food is wasted in each step of the supply chain, whether at the agricultural level in farms, during the distribution of the food, at the stores, and in our own homes. The first level of food waste occurs on the farm. Fifty-percent of land is used for agriculture, yet, an enormous amount of food is wasted due to a lack of storage space, labor shortages, weather, pests, and uncertain market demand (USDA).

Another significant problem with food waste is that schools buy more food than they need. The food waste was quantified as 75g of food waste per portion served, or 23% of the mass of food served (USDA). However, there was great variation between kitchens, with the waste level ranging from 33g waste per portion served (13%) to 131g waste per portion served (34%) (FDA). Wasted food consists of 64% serving the waste, 33% plate waste and 3% other food waste (USDA).

One way to reduce food waste is the food rescue process. We can reduce the amount of food waste we produce if we "rescue" food in the United States. It's simple, food rescue is the process of using leftovers in places such as colleges to feed people who cannot afford it. In some cases the food is donated to a local food shelf. Food Rescue US is an organization that uses volunteers to rescue and deliver food to social service agencies that provide food to those who need it. "Food Rescue US have delivered food for more than 36 million

fresh and healthy meals to people who don't have enough to eat" (Food Rescue) Additionally, since 2011 this organization has saved 50 million pounds of usable food from being dumped into landfills. The salvaged food is delivered to people in need. Restaurants, organizations and schools that produce extra food can donate the leftovers to help people living with food insecurity.

There are many ways to reduce food waste, from eating ugly food to recycling leftovers one could make a large impact and encourage others around them to try as well. People can use simple and easy methods to reduce food waste such as eating leftovers and eating food even if it has a bruise. If one reduces food waste they are also helping the environment. Reducing food waste does not take a lot of time or effort, but can have a large impact.

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# Organic vs Local

Ella Stainton and Iris Puchalik

If you care about your health and the environment, is it better to buy local or organic? It depends on factors ranging from the environment, accessibility, health, and price. Will eating organic or local make you healthier? Some people say local food is favorable compared to organic food because they know where their food is coming from and where their money is going. They also argue that local food is more eco-friendly. On the other hand, some people think organic food is best because they know that it doesn't contain GMOs, especially if they're allergic to the chemicals in it. Consumers also want to have access to healthy food that's in their price range. Is organic or local food more beneficial to the environment and health, while considering accessibility and price?

One aspect of why organic food is preferable to local food is because the consumer knows that it's pesticide and GMO-free. Pesticides are used to control weeds. GMOs are used to increase the production of plants and animals (Robinson). "The USDA qualifies produce as organic if no synthetic pesticides, chemical fertilizers or genetically modified organisms (GMO) are used (Goldberg). The ways in which pests and nutrients are controlled makes organic food better than local food. Conventional farming uses synthetic fertilizers and pesticides that can cause a loss in biodiversity, water pollution, and soil erosion (Varanasi). Conventional farming uses pesticides, while organic farming does not. Therefore, organic food doesn't cause as many harmful impacts, chemical-wise, to the environment. Local farming does not have standards to ensure non-GMO and pesticide-free products, even if they are using organic practices. Any consumer interested in ensuring their food is GMO or pesticide-free, would want to choose organic food rather than local food.

Local food is possibly an optimal choice over organic food because local food has been proven to contain more nutritional quality.

Produce at farmer's markets are often picked and sold within a few days. "That translates into fresher, and more nutritious food because vitamins and minerals and other nutrients haven't had time to break down yet" (Wadyka). Choosing fruits and vegetables grown in season may also be healthier. "When researchers at Montclair State University compared the Vitamin C content of broccoli grown in season with broccoli imported out of season, they found the latter had only half the Vitamin C" (Honeycutt). The ways in which local foods are picked and shipped compared to organic food make local food a more appropriate choice healthwise. Local food provides more nutrients and vitamins so it's more beneficial healthwise. Evidence shows that while imported organic foods are still reliable sources of nutrients, they have fewer nutrients because they break down during the time that it takes for it to be shipped. If the consumer wants fresher and more nutritious food then local is the preferred choice.

Organic food is more accessible than local food, which makes it a more favorable option. Organic foods are easier to access because they are sold at many grocery stores, and grocery stores are easier to access than local farmer's markets and general stores, especially in urban areas where farms are scarce. One-stop grocery shopping at big box stores saves gas mileage (Top). There are large grocery stores that carry local food products but only a few, the majority of it has been transported at least 1,200 miles, this destroys the point of having access to local food at all. There is a wider variety of food at grocery stores than farmer's markets, including organic options. In all, organic food is a more attainable option for everyone.

Local food production has less of an environmental impact in terms of transportation and packaging than organic food, which makes it a more favorable food option. When going to a local farmers market the produce is fresh and sold throughout the day (Wadyka).

In most of the United States, local produce is sold in local shops and not in large supermarket chains (Nicodemo). "Many states have limited "local" to mean produced within the state, and some retailers and restaurants have their own definitions. Many farm-to-table restaurants, for example, only serve food from within a 100-mile radius" (Goldberg). Local food has to travel less distance, resulting in a smaller carbon footprint than organic food, which can be distributed a much farther distance to grocery stores around the country. Local food uses less gas because it is being transported a shorter distance. The packaging of local food is also beneficial environmentally compared to organic food as it's not often sold in large stores and therefore does not need to be packaged in plastic to preserve its freshness. Organic food is often sold in supermarkets and is usually wrapped in plastic or available in a plastic container of some sort. The evidence shows that according to how local and organic foods are packaged and transported, local food is a more eco-friendly option.

Organic food has national regulations that ensure quality, whereas there are no regulations on local foods -- which makes organic food a more reliable option. To call a product organic it has to be "certified to have grown on soil that had no prohibited substances applied for three years prior to harvest. Prohibited substances include most synthetic fertilizers and pesticides" (McEvoy). Another source says that the farmers have to control pests and nutrients through natural controls. Local foods only have one "rule" and even then, it is often a loose regulation. The only regulation about local food is that it has to be grown and transported less than 400 miles from the origin point (Goldberg). Overall, organic is a more dependable choice over local because it ensures standards that are nationally upheld.

How do accessibility, health benefits, and environmental impact affect whether organic or local food is more favorable? The consum

# The Secret World of Hershey's Chocolate

## Autumn Snow

Did you know that people buy \$6 billion dollars worth of Hershey's chocolate bars each year? (Daniel). Considering how much money Hershey's makes, it seems important to know where Hershey's gets their cacao beans, who picks them, and what the conditions are like for the farmers who harvest the cacao beans. Hershey's chocolate bars are produced in manufacturing plants across the United States, Canada, Mexico, and Brazil. The cacao beans are picked and packed in West Africa and are shipped by boat to New York for distribution across the country (Hershey). Other ingredients like sugar and vanilla are shipped in from Indonesia and Central America respectively (Hershey). How are Hershey's chocolate bars produced and are the company's business practices ethical and sustainable?

One way Hershey's is not sustainable is that the way cacao beans are grown harms the environment. To plant the cacao beans farmers have to cut down many trees to make cacao farms. Cacao beans need space to grow, and the earth needs people to be growing more trees, not cutting them down. The farmers have also decided to grow their cacao bean plants in the sun instead of in the shade, which causes some problems. Farmers are cutting down forests in West Africa to make space for cacao bean trees, "Many forests have been cut down due to cacao bean planting and harvesting as the crop can only be grown 15 degrees north or south of the equator" (Cook). Consumers who eat Hershey's chocolate like the taste of sun-grown cacao better. "As the demand for chocolate increases, so does the need for cacao. Farmers have found a faster alternative in using sunlight cacao bean farming over shade cacao beans that value numbers over taste and with this, the cacao beans are more easily infected by diseases and ruined by pests" (Shun). Farmers should stop cutting down forests and plant their cacao in the shade so bugs and diseases will decrease (Cook).

A second reason why Hershey's is not eco-friendly and sustainable is that the farm-

ers and workers who pick the cacao beans for Hershey's work in unacceptable conditions and do not earn a livable wage. The people who pick the cacao beans are mostly children. The children work with sharp knives; they don't have the safety equipment that is needed, and the adult workers do not earn a livable wage. The workers earn 2 dollars a day, which is a very small amount of money, but the children do not get any money for working and are basically slaves. "Most of the children laboring cacao beans are between the ages of 12 and 16, but reporters have found children working at the age of five. In addition, 40% of these children are girls" (Child). The children don't even have helmets to wear when working, and the adults and children have to work around dangerous animals such as snakes, poisonous bugs and insects. Older workers should be given a much higher wage because they are given almost nothing, the children should be paid to work because they are being treated like slaves, and both young and old workers should be given work equipment (Child). Many consumers are not aware of the way cacao plantation workers are paid. If consumers were educated about chocolate production, maybe they would be willing to pay more for a Hershey's chocolate bar.

Yet another reason why Hershey's is not eco-friendly or sustainable is that there are health and environmental issues in the milk that Hershey's uses. Hershey's milk has chemicals that are unhealthy for humans to consume. The cows that produce Hershey's milk are fed grain with growth hormones in it so the cows will grow up faster and produce more milk. This means growth hormones could end up in the milk chocolate that Hershey's makes. The farmers should stop using growth hormones and let the cows grow naturally (Festa). From an environmental standpoint, dairy cows also produce methane gas, which contributes to climate change. On large farms, vast acres of cropland are needed to spread manure and waste and to absorb methane gases. "Insufficient

acreage leads to air pollution because of the large amount of methane" (Festa). The milk used by Hershey's to make chocolate has an environmental impact as well as health risks for consumers.

Despite the negative environmental impact of the company, Hershey's uses some of its profits for good causes. They donate some of their profits to places that support children and other charities. Hershey's supports many charities that support children, causes related to education, civic community, arts, culture, health, human services, or the environment (Donations). But Hershey's biggest charity is The Milton Hershey School. The Milton Hershey School is a free school for low-income children. Hershey's donates \$118,400 dollars per student. There are 2,300 students in total which amounts to \$272,320,000 dollars! "Eric Henry, the chief executive officer of the Hershey Trust Co., said the charity expects to 'spend every dollar' of its income and some of its reserves to expand the school to over the next five years to 2,300 children" (No). Even though Hershey's contributes funds to charities, compared to their annual profits, they are only spending about two percent of that on charitable donations (No). This means that Hershey's could be spending more on charities and helping children but chooses not to.

Hershey's is trying to make its factories more eco-friendly and sustainable. They have recently made its packaging lightweight which has saved some plastic from going into the environment. They have reduced their plastic wrapping by 0.05 grams. They've also cut down their paper use and saved 1,957 trees. "In 1937, Milton Hershey started the company's first recycling center in PA. To further efforts in keeping the environment safe" (Manufacturing). Hershey's is trying to switch over to more eco-friendly appliances such as energy-efficient lighting and biogas capturing equipment, which reduces greenhouse gas emissions. They are trying to become a better chocolate company by achieving 100%



# The Bitter Truth About Chocolate

By Ruby Souigny

Did you know when you buy chocolate, there is a chance you are supporting child labor?

In the US we consume 2.8 billion pounds of chocolate a year, which is 11 pounds of chocolate per person (Legend). There are a lot of dangerous child labor practices being used in the chocolate industry. When Americans buy their favorite chocolate bar, they may not be aware that they are supporting children doing hard work for sixteen hours a day in unsafe work environments. Even popular companies like Hershey's, Mars, and Nestle have been found to use child labor in their cacao production. What are some of the problems with using child labor in the chocolate industry and what can be done to change it?

Child workers are exposed to unsafe working conditions on cacao plantations. Children use dangerous tools like machetes and sharp knives to harvest the cocoa pods and they are forced to carry heavy loads of cocoa pods for sixteen hours a day. "The Tulane survey found that 71% of children working on cacao plantations were exposed to sharp tools, and in the Ivory Coast, 37% of kids farming cacao had suffered 'wounds' or 'cuts'" (O'Keefe). When the children are harvesting cacao, they have to climb up ladders with machetes and other sharp tools to cut down the cacao pods hanging from the trees. When the children on the ladders cut the cacao pods down, the children at the bottom have to put the pods in baskets and carry them over harsh terrain to get to transport trucks. Carrying very heavy loads can inflict pain and injury for these young bodies (Human). Aly Diabate, a former cacao slave/said, "Some of the bags were taller than me. It took two people to put the bag on my head. And when you didn't hurry, you were beaten" (Child). Child workers do not have a choice whether or not they use these dangerous tools, because it is the way cacao pods are harvested, so without using these tools they would not be able to do their work quickly. It is not just the conditions of the work they have to do, but also how they are treated by their employers. Many child laborers are taken

from their homes by force and don't have a choice about working on the plantation. Traffickers take these children from their homes, so the children are too scared to ask to change the way that they work.

These children are also affected by the chemicals that are used to make cacao plants grow faster. Workers have to use dangerous chemicals that especially affect the growth of young children. The children working on these farms have the common job of spraying chemicals and pesticides on the plants and trees to make them produce more cacao pods. When any human is exposed to lots of chemicals for long periods of time they experience side effects, however, it is especially harmful for young children we are still developing. "Tropical regions such as Ghana and Ivory Coast consistently deal with a prolific insect population and choose to spray the pods with large amounts of industrial chemicals" (Child).

Child labor on cacao plantations interrupts these children's education. When these children are working on these plantations instead of being educated in schools, the likelihood of them getting a different, safer job in the future is very low. "On cacao farms, 10% of child laborers in Ghana and 40% in the Ivory Coast do not attend school, which violates the International Labour Organization's (ILO) Child Labour Standards. Without an education, "the children of the cacao farms have little hope of ever breaking the cycle of poverty" (Child Labor Laws). When the children are going to the plantations the traffickers do not warn them of the conditions so they are not prepared for the work that is their future.

For chocolate companies, buying their cacao from the farms that use child labor is much cheaper. In the documentary *The Dark Side of Chocolate*, the reporter who visits cacao farms in Ivory Coast explains how companies like Hershey's don't pay the landowners enough for them to pay their workers a fair wage. Local businesses will buy cocoa from plantations and sell it to large corpora-

tions like Hershey's. For two pounds of cacao beans a landowner will be paid approximately \$1. This low rate of exchange means that a landowner would not make enough money to pay a fair wage to all of the children who are doing the work of harvesting the cocoa. "With 2 pounds of cacao beans, Hershey's is able to produce 40 chocolate bars, which they sell for an average of \$0.79 a bar. This means that Hershey's is making a profit of nearly \$30, while the landowner only makes approximately \$1" (Resources). This system is what allows chocolate companies like Hershey to sell such cheap chocolate to American consumers. If companies paid child laborers a fair wage, consumers would need to pay more for their chocolate bars.

Many companies agree to stop using child labor, but it's hard to enforce those rules in the countries where it is grown. Hershey's, Nestle's, and Mars signed the Harkin Englein protocol in 2001 to stop using child labor. "This protocol was also signed by farms in Ivory Coast, the biggest cacao producer and the largest use of child labor in their cocoa farms" (Harkin). Buying fair trade chocolate is one way that the community can help reduce the amount of child labor in the chocolate industry. Fairtrade means zero-tolerance for child labor, and the organization works to bring an end to such practices.

Fairtrade products do not use child labor, therefore, if consumers start buying and supporting fair-trade companies instead of companies that use child labor, they would be helping to end the practice. To be Fairtrade certified organizations must conform to rigorous environmental standards. Companies have to have a clean and safe work space, no chemicals of pesticides tested on the product, manage their waste in a clean and proper way, and there has to be zero child labor being used.

Buying cacao from farms that use child labor is cheaper than buying for fair trade farms, but these kids are treated badly, use dangerous tools, and are exposed to chemicals

# Flowers from South America: The Environmental and Social Impact

By Ethan Potter and Bella Crowley

Did you know that Americans buy nearly four billion flowers from South America each year? (Damian) But with that comes many consequences. The practices of the flower industry are concerning because it affects the environment, as well as the workers who harvest, package, and ship the flowers. What are the environmental and social impacts of commercial flower farming in South America?

The flowers that are transported long distances from South America to the United States burn fossil fuels that contribute to global warming and are harming the environment. Trucks and airplanes are used primarily to transport the flowers and they emit a significant amount of CO<sub>2</sub> (carbon dioxide). In South America, there are about 9,000 metric tons of CO<sub>2</sub> that are being released into the air for every 100 million roses shipped (Whelan). Americans ship flowers from so far away because these countries often have less strict environmental regulations and workers can be paid less than American workers. Another reason Americans buy flowers from so far away is that many holidays when people typically exchange flowers fall during winter months when flowers can't grow locally. The demand for cheap and constantly available flowers has negative environmental consequences.

The chemicals used on flower farms are affecting the environment of South America. Chemicals that are sprayed on the roses wash off into the soil and then go into the groundwater. These chemicals can kill native plants that depend on the groundwater. Some of the chemicals that harm the environment are desiccants. Desiccants are used to dry up living plant tissue, we need plants because of there a source of oxygen and food (Types of Pesticides). Defoliants cause plants to drop their leaves (Types of pesticides) and algacides are chemicals used for killing or slowing the growth of algae, algae are important because algae is a source of oxygen which is made by photosynthesis (Types of Pesticides). The chemicals that are left in their containers can leak out into the ground, which adds to the

soil contamination and prohibits plants from growing (Mc Quaid). These chemicals are used to ensure that the flowers grow quickly and look perfect (without blemishes from bugs). However, these chemicals are killing the environment because they affect the surrounding plant life and water systems.

The flower farms are unstable because they're only growing one flower which is a monoculture. A monoculture is not sustainable for the environment because the crop is more prone to wide-spread failure if there is a disease that affects that particular species (Mc Quaid). When there is a diversity of types of crops being grown, if one crop is destroyed by a disease the others won't necessarily be affected. If the flower farms were to grow more than just one type of crop there would not be much as stress about the crop failing. However, these flower farms want to ensure business with large-scale flower distributors, so they grow lots of whatever the most popular types of flowers are. If flower trends change or disease strikes that species, many of these flower farms are likely to go out of business, and then their workers would lose their jobs.

One additional downside of the floral industry is that workers are being treated unfairly (Oliver). In an interview, one flower grower described her workday. "Lydia Lopez Gonzalez's day starts at 3:30 am. That gives the 47-year-old single mother from Facatativa, Central Columbia, time to make breakfast and lunch for her daughter before leaving for the flower fields at 5:00 am. Many families don't spend much time together due to their work schedules. Workers are being treated unfairly because they work for nearly 16 hours a day, and some work for 19 hours a day. The majority of workers are not being paid the right amount for these long hours of work. "The minimum wage in Colombia is around \$300 a month" (Oliver). Although the workers in the floral industry in South America are not treated well, this work is how they get the income and not buying flowers from South America could negatively affect them.

Another concern with the South American floral industry is that the pesticides they use on the flowers, such as fungicides and insecticides, have been making contact with the worker's skin and causing health problems. Fungicides are used to prevent fungi on the flowers and insecticides are used to repel insects from the flowers. Workers get those pesticides on their hands when they work and pesticides can cause severe medical conditions that could worsen over time. Sometimes they could even lead to cancer. Some workers have been having issues with their wrists due to cutting so many flowers a week.

On the other hand, buying flowers from South America has a positive economic impact. South America's flowers are how they make lots of their money and they get nearly \$1.34 billion a year due to such high productivity in the floral industry. "Walmart alone is purchasing 24 million Columbian roses to sell for Valentine's day...There are 130,000 Colombians working in floral culture" (Damian). On special occasions such as Valentine's Day, anniversaries, and other special times, roses are mainly purchased from South America. South America exports nearly 4 billion flowers a year to the United States. The floral industry brings in large profits each year. "In rose beds, money blooms" (Damian). Roses are South America's most praised flower because of how high maintenance they are and because they make the most money off of them.

The environmental and social impact of commercial flower farming in South America is controversial. Chemicals used on the flower farms are polluting the environment and the transportation of the flowers causes climate change because of the fossil fuels that are being burned. The flower farms are growing a monoculture because they're only growing roses that are not sustainable. Furthermore, this problem matters because the workers are being impacted and so is the climate. There would be no more room to build other farms with different crops because it would cost a

# McDonald's vs Five Guys

Levi Mintz & Maple Moore

McDonald's, the king of fast food, and Five Guys, an underdog. Which do you think is healthier? When you think of fast food, chances are you'll think of McDonald's -- the golden arches are easily one of the most iconic symbols on Earth. In contrast to this giant, there are smaller fast-food chains, such as Five Guys. Many believe smaller chains to be the healthier option, but is this really true? The only way to come to an educated conclusion will be to dive deep into both of these industrial titans. Which fast-food chain is superior, in terms of nutritional, social, environmental, and economic impacts?

Out of the two chains, McDonald's is the nutritionally healthier option. This is extremely surprising for many, as McDonald's is notoriously unhealthy. A cheeseburger from Five Guys has around 980 calories, with a hamburger weighing in at 840 (Welcome). The amount of calories increases if various available toppings are included in the order. The most iconic burger at McDonald's, the Big Mac, contains only 540 calories. The highest calories item at McDonald's, is the Double Bacon BBQ Burger, packing 920 calories. An order of fries from Five Guys is around 530-1310 calories, varying depending on the size. The amount of calories in the fries at McDonald's varies depending on the size, with a small fry having 220 calories, medium containing 320, and large with 490. If a soft drink is added to a meal of a cheeseburger and fries, it will add up to around 2,120 calories at Five Guys (Welcome), and 1,080 calories at McDonald's. The recommended amount of calories that should be eaten per day is 2,000, and this single meal exceeds that. Another factor to take into account is the lack of vegetables available at Five Guys. A Veggie Sandwich and a few different toppings are the only available greens (Welcome), whereas McDonald's has various salads and they offer things like yogurt cups and apple slices (McDonald's: Burgers).

Both McDonald's and Five Guys use beef that has been fed antibiotics, so there is no

winner here. Antibiotics are what large farms put in their animal feed to kill bacteria. In an article by CBS NEWS, reporters found that Five Guys and McDonald's both received failing grades for their antibiotic policies and practices were tested (Baldwin). Although giving cattle antibiotics may seem like a good way to kill bacteria, the practice is extremely hazardous. Since bacteria can adapt and evolve, making antibiotic-resistant bacteria and viruses. An article by CBS news, it reports "Each year in the U.S., at least 2 million people get an antibiotic-resistant infection, and at least 23,000 people die" (Baldwin). Antibiotics in food can affect millions of people in a potentially fatal way. McDonald's serves 68 million people a day, and since they use antibiotics in their beef, this means many more people are getting antibiotics. The more people that consume antibiotics, the more antibiotic-resistant infections and bacteria. While McDonald's is not the only fast-food chain to do this, they are the biggest. McDonald's has recently spoken about changing their policies on antibiotics. If they do, it would have a powerful impact on the beef industry, since McDonald's is such an immense consumer in the supply chain.

McDonald's, Five Guys, and most of the beef industry have a negative impact on the environment due to the emission of greenhouse gasses (Pearce). Both of these fast food chains are very large purchasers of beef, especially McDonald's, which has 36,000 more locations across the world, and buys far more. Most, if not all, of the beef that these restaurants buy is from massive factory farms known as CAFOs (Concentrated Animal Feeding Operations). The job of these CAFOs is to raise and slaughter animals at a colossal rate, as efficiently and cost-effectively as possible.

The conditions of the factory farms where the beef for McDonald's and Five Guys is raised are often known to be unethical and inhumane. As mentioned prior, most of the beef in the food at Five Guys and McDon-

ald's is grown in CAFOs. These facilities are designed to efficiently raise and slaughter beef, so the safety of the animals and workers is not a top priority (Pearce). One of the more notable aspects of CAFOs that could be seen as inhumane is the amount of space that the animals have to live, in relation to the number of animals that are actually being raised there. These crowded factory-like conditions are where the cows spend their entire, short lives. When it comes to methods of slaughter, efficiency is the name of the game as well. Animals being held together in such close quarters could lead to disease, which creates the possibility of infected workers.

Jobs at Five Guys and McDonalds, as well as other fast food chains, are looked down upon in today's society. Fast-food workers often have one job in the preparation of a meal, like flipping patties or working the fryers. Although this work is not typically life-threatening or dangerous, it is extremely tedious and cumbersome. Transferable skills will probably not be gained from this work as fast food jobs generally require little technical skill. This repetition can cause stress, from boredom and repeated motions (Pearce). The wage for McDonald's and Five Guys is relatively low, compared to the repetitive and stressful work that they have to perform constantly. The average McDonald's wage is 9 dollars (Average Hourly Rate for McDonald's), while Five Guys is around 10 dollars (Average Hourly Rate for Five). However, the factory workers at CAFOs and factory farms have jobs that are completely different. They are often in danger of being harmed by the machines that are used on the animals, and are at high risk for disease due to exposure to cows and cow feces. Around of blue-collar workers in the beef industry are not American citizens, which makes them much easier to exploit (Pearce), as they cannot really speak out about these harsh working conditions, out of fear of being deported by the government.

Overall, there is not a simple conclusion about which is better in the **comparison of**

# Raw Milk Versus Pasteurized Milk

By Mason Griffith and Connor Bowen

Did you know that raw milk can boost your immune system and help keep your bones denser and stronger than pasteurized milk? This is due to the additional calcium in raw milk. However, raw milk is outlawed in several different states in the U.S. Raw milk is milk that has not been pasteurized. Pasteurization is when raw milk is heated and then cooled rapidly. It was developed by Louis Pasteur in 1864 to improve the keeping qualities of wine (Ullmann). Commercial pasteurization of milk began in the late 1800s in Europe and in the early 1900s in the United States (Ullmann). The typical American consumes 276 pounds of dairy and 199 pounds of fluid milk a year (Runge). Raw milk can contain harmful bacteria that could potentially make consumers sick. Raw milk can only be sold where it was made and can not be resold, and in certain states, it cannot be sold at all (Ullmann). Raw milk can be unsafe, but it can also be very beneficial. What are the benefits and disadvantages of raw milk versus pasteurized milk?

One benefit of pasteurized milk is that it keeps longer before spoiling. This is because pasteurization kills most of the bacteria, therefore a longer shelf life is possible. Pasteurized milk can be held in a fridge for 12 to 21 days (Department), while raw milk can only be held for 7 to 10 days (Raw). Raw milk can not be shelved for long because once the nutrients have been exposed to oxygen they only have about 5 or 6 days to be bought and consumed after being transported and put into storage. Due to its shorter shelf life, raw milk can create more food waste than pasteurized milk.

Another disadvantage of raw milk is that it can carry bacteria such as E Coli and salmonella. This is because it has not been pasteurized which would kill those bacteria. "In Colorado in 2015, 12 people were infected with a drug-resistant strain of *Campylobacter jejuni* after drinking raw milk" (Blaxland). Some of the effects of bacteria in raw milk are diarrhea, stomach cramping, vomiting,

paralysis, kidney failure, and stroke.

A benefit of raw milk is that producing it requires less energy than pasteurized milk, because of the heat required for pasteurization. Pasteurizing milk involves heating it up to 72°C for a minimum of 15 seconds and then rapidly cooling it to 3°C (Blaxland). Comparatively, raw milk comes straight from the cow and uses no energy except for when milking the cow. Pasteurized milk has a larger carbon footprint than raw milk. Through a study conducted to estimate the carbon footprint (CF) of milk, The Intergovernmental Panel on Climate Change found that the average carbon footprint for 1 kilogram of fat-protein corrected milk at the farm gate was 1.57 kg CO<sub>2</sub>-eq. The main contributors to the overall carbon footprint of milk products were enteric methane 30%, electricity 14%, diesel 8.9%, manure emissions 8.8% and transportation 8.6% (Daneshi). Raw milk is more efficient than pasteurized when it comes to energy because to pasteurize milk it requires heat and more energy than just milking a cow. Fluid milk processing (FMP) has a significant environmental impact because of its high energy use (Winnie).

Another benefit of raw milk is that it contains many more nutrients than pasteurized milk because when pasteurizing milk it takes out certain vitamins and minerals. "One serving of raw milk contains about 400 milligrams of calcium, 50 milligrams of magnesium and 500 milligrams of potassium" (Procon). Whereas in one serving of pasteurized milk there are 300 milligrams of calcium 27.7 milligrams of magnesium and 299.4 milligrams of potassium (Procon). Pasteurization destroys the digestive enzymes needed to break down and absorb certain nutrients. Raw milk contains more nutrients because they are not destroyed by the heat of pasteurization. Raw milk has about two times the magnesium, which helps with muscle function, supporting a healthy immune system, keeping the heartbeat steady, and helping bones remain strong (Procon). Raw

milk also has about two times the potassium, which helps regulate the fluid balance, muscle contractions, nerve signals and has about 100 mg. more calcium than pasteurized milk per serving, which is significant since calcium enables our blood to clot, our muscles to contract, helps bones to stay strong, and our heart to beat. Nutritional deficiencies can cause digestion problems, skin disorders, stunted or defective bone growth, and dementia (Hill).

Both raw milk and pasteurized milk have differences, some are beneficial and some are not. Raw milk contains more nutrients but also contains unhealthy bacteria. Pasteurized milk keeps longer on shelves, but has fewer nutrients in it.

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# How do school lunches affect students mentally and physically?

Abby Chase

Did you know that the lunch your school is serving you could make you obese or cause harmful medical issues? (Black) An unhealthy school lunch can also affect grades and behavior. This issue affects children who eat lunch provided by a school that has less nutritional benefits than it might if the school were doing a better job with their services. The issue is significant because it can affect a student's whole life in a negative way. What are the advantages and disadvantages of unhealthy school lunches? How do they affect students?

Unhealthy school lunches in the United States are a disadvantage for students because they have added sugar and food additives. Added sugars don't give children any nutrients or protein, but increases weight and hyperactivity. School lunches may include some unhealthy ingredients such as artificial sweeteners, sodium, food additives, and phthalates (a group of chemicals used to make plastics flexible and produce certain solvents) (Smith). Food additives such as artificial sugars can cause obesity and high blood pressure. Sometimes metals such as arsenic, cadmium, and lead can get into students' systems from eating processed food such as foods that have a high level of added salt and sugar, canned fruits and vegetables, bread and, canned fish (Processed). School lunches are often made with processed food, the previously stated metals are more likely found in processed food. If schools are offering mostly processed food with no alternative, students will most likely be eating food that is less healthy.

An unhealthy diet, of which an unhealthy school lunch can be part, can affect students' grades in a negative way. The sugar and additives in school lunches usually cause children to lose focus during academic classes. Once students eat something sweet they get a little hyper and the mind can't focus, the same sugars in the sweet desserts are also in school lunches. These sugars can cause students to lose focus in class so when it comes time to do homework or take a test, students may not have enough information to complete it the

correct way. School lunches can affect grades in a negative way by causing students to lose focus. Students may not even realize they are not paying attention and if students' grades are dropping, the lack of healthy food could be the reason behind it.

The third disadvantage of school lunches is that they can cause medical problems.

The additives, sugars, trans fats, sodium, and an excessive amount of carbohydrates and sodium. In the past few years, the number of students with type 2 diabetes has been increasing at a significant rate. At the moment, one in six children in the US have obesity, and obesity can increase the chance of diabetes. Food experts say that "By 2050, the number of people under the age of 20 in the U.S. with the disease is expected to almost quadruple" (Black). As the number of children with obesity rises, the number of children with diabetes will also rise.

One advantage of school lunches is that if children can't get food at home, they can get food at school and actually eat something. This is both an advantage and a disadvantage. It's an advantage because if children didn't get lunch from school, they may not have any food at all. It's a disadvantage because most of the time, US school lunches aren't the healthiest option for students so the only food some students are getting has a negative impact on their body and minds. Families who can't afford food to give to their children for lunch rely on school lunches. Even if the food isn't the healthiest, the students still get some kind of food. School lunches allow students to have easy access to food for lunch but the food isn't healthy. But, this is an advantage because students will still get food and be able to survive on the food they're getting from school.

The last advantage of school lunches is that providing healthy school lunches can teach children about nutrition to help them later in life. Students can learn about what to look for vs. what to stay away from when looking for the best food in the future. Stu-

dents can also compare what they are eating for lunch versus what other students are eating for lunch and what is better or worse. This is an advantage because if children learn about what's healthy and unhealthy for them early on, they won't struggle as much later in life when they need to choose their own food and provide healthy food for their family. (Nutritional) Learning about what's healthy and unhealthy for them will help them stay away from the foods that can make them obese or increase the probability of medical issues caused by food.

How do school lunches affect students' physical ability and mental health? School lunches can be very unhealthy, but they can also provide food for otherwise food insecure families and teach kids about food. The unhealthy non-nutritious food served for school lunches has a negative effect on a student's physical and mental health. Healthy lunches will enable students to learn and grow so that our nation can compete on a global level. Overall, most schools in America go for the cheapest option which is usually the least healthy option. If that is the case, students aren't getting the nutrition they need to do their best in school and in the end that can affect our whole country.

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# What It's Like To Run A Vermont Small Farm?

Jay Braun

Tail Feather Farm is a small Vermont family farm located in Middlebury, which is run by Tom and Jennifer Kennett. In 1998 the Kennetts started in the small town of Rochester, but as the farm grew they relocated it to Middlebury. The move provided more space for beef cattle. The farm is now thriving. Some of their products include beef, pork, eggs, and maple syrup. Their products are sold at their farm stand, as well as at the Middlebury Co-op. In the summer, they also have a farm to table suppers in order to help develop a better sense of community. Tail Feather Farm is one of 176 family farms across Vermont.

Jay: What are some of the regulations (government hassles) you have to do before you send your farm products to the store(s) for selling.

Jennifer: There's a wholesale license and a retail license. The storefront and the farm stand require a retail license. Wholesale means we can sell to stores and restaurants. Without it, we can't legally sell our products.

Jay: Explain the process of raising an animal from birth on the farm.

Jennifer: The cattle are born and raised on the farm for about 18 to 24 months. During that two year period, the cattle are on rotational grazing out in the pasture. In the winter they eat hay and some corn.

Jay: What is the process of taking an animal to slaughter and then preparing the meat for sale?

Jennifer: The cattle are trailered and dropped off into a pen to be examined by USDA inspectors. We send the cattle the same day that they are going to be slaughtered. The cow is then slaughtered, cut in half and stored in a cooler for two weeks. During that time, the USDA inspector looks at the two halves again. The farmer fills out what is called a "cut sheet" in order to get the desired cuts. The USDA looks at the cuts and then they are vacuum packed, sealed and boxed with the farm's logo sticker, the date and the number of pounds on each cut. Then the meat is frozen and we can pick it up. We then sell it at either

our farmstand or wholesale to stores.

Jay: Can you sell all the meat you raised and how much is that? Would you be able to sell more if you had more?

Jennifer: The average amount of meat from each animal is 63% of the actual body weight. The normal body weight of one cow is twelve to thirteen hundred pounds, so that's about 787 pounds of meat per animal. Yes, I could sell more meat if I wanted to. We keep some meat to eat on the farm as well.

Jay: What is your opinion of large industrial livestock farms? And how is this farm different for the animals and people?

Jennifer: I believe in industrial farms on some level because it's where the cull cows go and cows that are not as healthy. Cull cows are old dairy cows or old beef cows. They generally need to be culled from the herd, cut from the herd to make room for new mommas. But the industrial farms should not take over the market. We are different because we treat our cows as individuals and can call them by name. We can recognize our cows from across the field by name and number. There is a different relationship with the land at our scale vs. an industrial farm.

Jay: Why do you think most people don't buy locally grown meat even though they think it's the more humane thing to do?

Jennifer: Because locally grown meat is more costly than CAFO meat. The farmer needs to charge more for their meat because it costs more to raise and feed animals humanely. Some people find eating animals that they drive by every day hard to eat. They have a connection with them. It is sometimes intimidating to buy from the place you live, even though it is so much better.

Jay: Why are locally grown foods more expensive than commercially grown foods?

Jennifer: Because local farmers have to take the time to produce them. The cost of producing local food is based on the cost of living. So if a farm is located in an area where the cost of living is high then the cost of their products will also be high.

Jay: If you could not take your animals to the local slaughterhouse, would you do an on-farm slaughter?

Jennifer: If I couldn't take my animals to the local slaughterhouse, I would do an on-farm slaughter. However, I prefer the availability of the local slaughterhouse.

Jay: Overall, what is it like to run a small Vermont family farm that raises livestock for meat, as well as other products?

Jennifer: It is oftentimes hard but rewarding because you are doing what you can to help supply consumers with better quality meats and produce than what comes from factory farming operations. It's hard financially because you need to pay for hay and feed for the animals, and if you have a family you need to count that as a cost. It's physically exhausting because I work hard each day either at the shop or on the farm working with the animals.

*Author's Note: While I interviewed Jen, we were cleaning the house. Farmers rarely sit. There is always something to do. Spending time on a farm is fun. Depending upon the season, there is always something important to do, and I learn a lot when I help the Kennetts out on their farm. They are running this business so that people can eat local meat. They are proud of what they produce because it does not have antibiotics in it. The meat is also richer because the animal was raised well and was happy. The Kennetts have become part of the community of Middlebury. I can't picture Vermont without small farms like Tail Feather Farm. I'm glad that I live in a place where we still have local family farms.*

# How Does Fast Food Relate to Obesity in the United States?

Madeline Mintz

Did you know that in 2016 statistics showed that about 40% of adult Americans were obese in the United States? Here are some of the ways that obesity relates to fast food in America. People are getting obese from eating fast food because of what it's made of, the quantity of food they are eating, and how easily they can access it. Fast food can cause obesity, but it can also cause some other serious health issues as well. What are the relationships between fast food and higher rates of obesity in the United States?

One of the relationships between fast food and obesity is that there are larger portions of fast food. The size of fast food meals has gone up. "When McDonald's first opened, a soda was 7 ounces. Today, the child-size is 12 ounces, a small is 16 ounces, and the large 32 ounces" (Young). People are becoming overweight because of the amount of fast food they are consuming. Regardless of the size of the meal, people will eat all of it, even if they feel full. They don't want to waste soda that goes flat or have cold fries. It's not only soda sizes that have increased. Some restaurants including Wendy's have increased how many fries are in each size. "What was a medium order is now a small" (Young). The portion sizes of fast food are continuously getting bigger, and people are still eating the whole meal. Because of this, people who regularly eat these larger portions are more likely to become obese.

Fast food also relates to obesity because people are choosing fast food over healthy food because it's cheaper. Fast food is cheaper and easier to access than a healthy homemade

meal. Comparing a homemade meal that costs approximately \$13.00 to a fast food meal that costs approximately \$6.00, most people would choose the cheaper version. People aren't choosing the healthier option even if they have the money needed to make a healthy meal.

Fast food is also connected to obesity because it is higher in calories. One medium Oreo Cookie Blizzard is 680 calories which is 30% of a 13-16-year-olds recommended daily calorie intake for the day. One Five Guys cheeseburger contains 840 calories which are 39% of 13-16-year-olds recommended daily calorie intake. When people consume these foods, they are eating way more calories than what they need in one day which contributes to weight gain.

Another way that fast food can connect to obesity is because it contains a lot of fat. Although everyone needs some fats and sugars, having this much packed into a meal isn't healthy. A McDonald's Big Mac has 29g fat so if there was a side of fries and a drink with that, that would add up to 60g of total fat (Young). People are getting overweight from this because there is way too much fat in fast food.

People are becoming obese from fast food because there are so many fast-food restaurants and they are very easy to access. There is always a fast food restaurant somewhere close to you. There is also the option to get take out which allows you to eat without doing anything or going anywhere if you get it ordered to your house. There are fast-food restaurants in White River Junction, West

Lebanon, Randolph, Rutland, Barre, and Claremont. If people don't have to go very far to get fast food, they won't.

Fast food can cause obesity, but it can also cause other serious health issues. These include diabetes, heart problems, stroke, and some cancers. (Darcey). Some people are getting overweight, or even dying, in part because of fast food. "Obesity has taken the shape of an epidemic in the USA and is leading to major health complications such as premature deaths and illnesses like heart disease, diabetes, fatty liver, arthritis, gallbladder disease, and joint disorders" (Darcey). Fast food is not only making people overweight, but it is also causing serious health problems. People are getting health problems including obesity because of fast food.

Fast food and obesity relate because fast food is cheaper, easier to access, convenient, the portions are large and filling, and it is high in calories, fats, and sugar. If so many people are becoming obese from eating fast food, why don't we reduce the number of fast-food restaurants in America? If there are so many unhealthy ingredients in fast food, why don't we change them?

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# Pancakes With a Side of Corn?

By Andrew North

Do you enjoy corn on your pancakes? Well, studies show that 70% of Americans do. Aunt Jemima is producing the sugar syrup that is harming the environment and unhealthy for consumers. Many people who consume the sugary substitute think that they are making a good choice. However, while real maple syrup is less cost-effective and less widely available, it is healthier for the consumer. With obesity on the rise, real maple syrup is clearly a better option for pancake lovers. In terms of accessibility, cost, environmental impacts, and health benefits, which is better: real maple syrup, or Aunt Jemima?

Real maple syrup has more health benefits than Aunt Jemima. Maple syrup is healthier because it has more necessary vitamins and minerals than Aunt Jemima. Real maple syrup contains Manganese, Zinc, Calcium, Riboflavin, Magnesium, and Potassium. “Deficiencies of Manganese can cause bone dematerialization, and proper growth and children, skin rashes, and hair depigmentation”(Office). Deficiencies of Zinc can cause slow growth in infants and children, and delayed sexual development in adolescence and impotence in men. It can also cause hair loss, diarrhea, skin sores, and loss of appetite. Weight loss, problems with healing, lowered levels of taste and can cause the consumer to be less alert (Office of). Deficiencies of Calcium can cause convulsions and abnormal heartbeat. This could cause death if left uncorrected (Office). “Riboflavin deficiencies can cause sores at the corners of your mouth, swollen and cracked lips, hair loss, sore throat, liver disorders, and problems with your reproductive and nervous systems.”(Office) In severe cases of Riboflavin deficiency, a shortage of red blood cells can occur and clouding in the lens of your eyes may also occur (Office). Deficiencies of Magnesium can cause loss of appetite, nausea, vomiting, fatigue, and weakness. More extreme magnesium deficiency can cause numbness, tingling, muscle cramps, seizures, personality changes, and abnormal heart rhythm (Office). Potassium deficiency can cause increased urination, decreased brain

function, high blood sugar levels, muscle paralysis, difficulty breathing, and irregular heartbeat.”(Office). While it is true that maple syrup is not a cure for all sicknesses it is a source of important vitamins and minerals, while also adding some sugar to the consumer’s diet.

Aunt Jemima has fewer health benefits than maple syrup. The high fructose corn syrup, calorie count and sugar make it unhealthy. HFCS (high fructose corn syrup) increases your risk of chronic and deadly health problems (Admin) In 2007, a federal government study concluded that 4-meI cause cancer in mice. 4-meI is a cancerous heterocyclic organic chemical compound. The study also found that 4-meI is possibly carcinogenic to humans. Researchers also sent out a cancer warning if a person is exposed to more than 29 micrograms of 4-meI a day (Caramel). Aunt Jemima contains 38 micrograms of 4-meI per 1/4 cup (Admin). Aunt Jemima is unhealthy because it contains dangerous amounts of 4-meI which can cause cancer. Maple, on the other hand, contains no 4-meI and even contains small dosages of necessary vitamins and minerals.

The high fructose corn syrup in Aunt Jemima negatively affects blood sugar. HFCS raises blood sugar which can cause obesity. Studies show that consuming 75g of carbohydrates in high fructose corn syrup causes blood sugar to rise 57% (Admin). Some of the side effects of high blood sugar include increased thirst, frequent urination, fatigue, nausea, vomiting, shortness of breath, stomach pain, and rapid heartbeat. High blood sugar can also cause a diabetic coma which can be fatal. While maple syrup does affect blood sugar because of the sugar content, the effects are less severe because the sugar in maple syrup is natural, not added.

Aunt Jemima’s impacts the environment more negatively than maple syrup. Producing Aunt Jemima takes more energy and makes more carbon emissions producing than maple syrup. To make maple syrup, 800 gallons of maple sap are needed. The sap is boiled down

which takes approximately 60 gallons of oil or a cord of wood. The costs of using these small amounts of fuel are relatively inconsequential. When producing Aunt Jemima a factory has to use enzymes to convert 90% of the glucose molecules into super sweet fructose before the resulting solution is blended with simple glucose syrup. It’s unclear just what kind of additional burden these final steps account for, but researchers do know that the entire corn wet milling process takes a lot of energy. Researchers found that, on average, fossil fuel use, greenhouse gas emissions, and the release of acidifying substances seem the highest with corn sugar (Sugar). Making maple syrup produces carbon emissions and uses energy, but making high fructose corn syrup and the whole costly process of wet-milling corn uses substantially more energy and produces harmful carbon emissions.

Aunt Jemima is less expensive than real maple syrup. The government subsidizes ingredients in Aunt Jemima. For Aunt Jemima to make corn syrup, corn starch is split into fragments with acid, and then converted into a syrup (Sugar). To make high fructose corn syrup the same process is used, but at the end, fructose is added (Sugar). Factories can efficiently process corn syrup and high fructose. The subsidies on corn make this process cheap. Subsidies are when the government uses tax money to reduce the cost of different products. One of the most heavily subsidized ingredients is corn. Overall the cheap and fast production of Aunt Jemima causes a lower price. To make real maple syrup, the trees need to be tapped for sap. This sap is then run down through pipes to a central boiling area where it is boiled into syrup. To make just 20 gallons of maple syrup 800 gallons of sap are needed (Ann). The labor-intensive process of making maple syrup causes a higher price. It is clear that the cost and speed of producing Aunt Jemima syrup makes it cheaper than real maple syrup. Aunt Jemima can be produced year-round instead of maple syrup which can only be made seasonally. Maple syrup also takes more time to pro-



# Wait, My Chicken Nugget is Made Out of What?

By Hayden Hewitt

Do you really know what's inside a Chicken McNugget? Turns out, you might not. A golden brown, deep-fried, juicy coating can hide a surprising number of health concerns. A McDonald's Chicken McNugget is composed of breast meat and chicken skin. Biting into a Chicken McNugget has a delightful taste. The Chicken McNugget is moist, tender and delicious, but do consumers know what they are biting into? Do they know the health risks? Or, how the process of making the nugget affects the environment? How does the production method and ingredients of a McNugget affect consumer health as well as the environment?

Where does the meat for their chicken McNuggets come from? Unfortunately, the answer is not very heartwarming. McDonald's gets its chicken meat from massive factory farms called CAFOs. CAFOs raise anywhere from 100,000 to 125,000 chickens. (CAFO) These chickens do not live a life worth living. They have a single square foot of living space, sleep on their feces, and are pumped full of growth hormones that make moving over to the water or feed supply a chore (Britannica).

But how does this relate to CAFOs affecting consumer health and the environment? There are many ways CAFOs can affect the well being of the consumer. Disease outbreaks like E. Coli and Campylobacter can occur on CAFOs. One example of an outbreak occurred at a CAFO in Walkerton, Ontario. It was reported that heavy rainfall washed manure into well water, which was used by the public, and contaminated the drinking water with high concentrations of E. Coli and Campylobacter. Reports state that over 2000 people were affected, and seven people died (Ebner). If the publicity surrounding the CAFOs are victims of these diseases, disease outbreaks from CAFOs could drastically negatively affect consumer health.

Now that it's been established where the chicken meat comes from, it is time to examine the production method of the Chicken McNuggets and its effect on the environment. A chicken must be processed

before it can be turned into a Chicken McNugget. The first step is the separation of chicken breast meat. The meat is then thrown onto a conveyor that transports the breasts to a bin with other breasts. After the bin has been filled, all the breasts are then dumped into a grinder with some chicken skin and seasoning. McDonald's claims the chicken skin is for natural flavoring (Godoy). After the breasts have been ground up, chicken meat is put through a shaper, which forms the McNuggets into their four iconic shapes, the bell, the ball, the boot, and the bow tie. They move onto the battering stage, where they are covered in a light coating of batter, and the second coating of the batter is added on top of the first. Next, the nuggets are par-fried, to solidify the coating, and then they head to packaging. The nuggets are packaged into bags, flash-frozen, and loaded into boxes for shipping. Finally, the nuggets are sent off to the restaurants, where they are cooked in a deep fryer (Godoy).

The low price of nuggets affects consumer health because consumers can consume more Chicken McNuggets. For example, at McDonald's, a four-piece nugget box costs \$2.49. A six-piece nugget box costs \$3.49, the ten-piece nugget box costs \$4.49, the twenty-piece box costs \$10.00, and finally, the 40 piece nugget box costs \$20.00. A person living on the average minimum wage, (about \$11.25 per hour), needs food, will be more likely to purchase McDonald's McNuggets. One 10 piece serving will provide 97% of their total fat amount, and 75% of their daily sodium intake, and 50% of their daily protein (Nutrition). Obviously a person that consumes a 10 piece nugget meal will also eat other food during the day and likely exceed their daily recommended fat in a day.

When Chickens are raised on CAFOs they are injected with artificial growth hormones when they are very young, that artificial growth hormone is called Triiodothyronine. Triiodothyronine is an artificial growth hormone that makes livestock grow three times as fast as it normally would, and consumption

of this chemical by humans has been linked to some serious health issues. McNuggets that contain Triiodothyronine have been linked to hyperthyroidism, (a disorder where one's thyroid gland produces too many hormones), and other thyroid problems. Sodium Phosphate, a type of salt, is added into the seasoning, as well as the meat. Consumption of Sodium Phosphate has been linked to accelerated aging, and vascular damage, which can include coronary artery disease, high blood pressure, cardiac arrest, congestive heart failure, arrhythmia, peripheral artery disease, stroke, and congenital heart disease. Consumers who eat Chicken McNuggets may not realize that there are unhealthy chemicals in their food.

According to the nutrition label, McNuggets have very high levels of saturated fat, sodium, and cholesterol, and protein. The levels of these nutrients in Chicken McNuggets push the limits of healthiness. (Cronkelton) McNuggets have an excess amount of sodium, cholesterol, and saturated fat. If the body consumes too much sodium, the kidneys won't filter, bloating, dehydration, and high blood pressure (Bender). Consuming too much cholesterol can lead to chest pain, due to blocked arteries and blood vessels to and from the heart. The body also becomes extremely susceptible to heart attacks, and an increased risk of stroke (Mayo Clinic Staff). Finally, there are high levels of saturated fats. When the body gets too saturated fat, the body reacts in a very similar way compared to how it would react to high levels of cholesterol (Wax). Like high levels of cholesterol, too much-saturated fat can make the body more susceptible to heart attacks and strokes. Consumers who regularly eat Chicken McNuggets will build up more and more of these unhealthy substances.

How does the production and ingredients of a McDonald's Chicken McNugget affect consumer health and the environment? CAFOs often have disease outbreaks which can affect consumer health by causing illness. The excessive consumption of Chicken

# Is Eating Local Really the Best Option?

Diana Parker

Many people are starting to eat local foods, but is it beneficial? What are the consequences of eating locally, and is it better? Local food affects all people who eat it, and the farmers who grow it. The word “local” is defined as food grown or produced within a hundred-mile radius (Hand and Martinez). People usually eat local foods because of the supposed health and environmental benefits. Although eating locally can be positive in some ways, it has some issues and is not always beneficial. What are the benefits and disadvantages of eating locally?

Eating local food is more expensive than non-local foods. One example is a locally grown tomato from Long Wind Farm which costs around \$5.00 per pound, compared to a non-local tomato which costs around \$2.17 per pound (Conway). Another example is Vermont’s local “Smoke and Cure Pepperoni” which costs around \$8.00, compared to non-local Hormel pepperoni which costs around \$3.46. It would be difficult for a low-income person, or even an average income person, to afford local food. This means “local” is not always the best option.

Some local farms pollute the environment. Local does not always mean environmentally friendly. If the farm is polluting the environment, then eating locally is not the best option to help the environment. For example, Franklin Dairy Farm was sued because it expanded without telling the government, which could have led to water pollution (Elletson). Another example is a farm in St. Albans that was polluting the water with manure (Colby). This shows that local farms are not always an advantage and that eating local does not always positively help the environment. Some people who choose to eat locally do it for environmental benefits because it is not transported as far, but they should be aware of the environmental records of the farms they support.

Local food does not always give consumers a variety to choose from. To be true “locavores”, consumers can only eat the food that grows within a hundred-mile radius

of their home. In Vermont, there is a lack of many foods that would grow in warmer climates. For example, grapefruits and other citrus fruits would no longer remain in a Vermonter’s diet if they were a true “locavore”. By only eating locally, consumers are limited to foods like dairy products, animal products, and root vegetables in the winter. There are also many animals that are grain-fed from non-local products. “Most dairy cows these days are Holstein. They have been bred to yield so much milk every day that they have a high protein diet or they starve. What they’re living on is some Vermont grass and a lot of Midwestern and Canadian grain.” (Perrin). If a person was to eat truly local they would still have trouble finding dairy and meat products, because the animals are still eating non-local products. Because Vermont only has a few types of food that can grow, it leaves consumers without many important nutrients. There are not many fresh fruits or vegetables that can be grown in the winter, leaving consumers with not many options.

Local food supports the local economy. Eating locally helps small farms, and more jobs are created. When a farm makes more money, they can hire more workers. According to a study for every one million dollars a farm earns, there are about 32 new jobs created. A farm that makes \$350,000 is more likely to positively increase their income in the future because farmers are getting more money they can buy more equipment and grow more products. This can increase the amount of income made in the future. (McKibben 56-60). By creating more jobs it’s creating more opportunities for people to make money, it is also helping local farmers.

“Local” food is within a hundred-mile radius, so it is not transported as far as non-local foods. Transportation can affect the environment. Non-local produce is being shipped by trucks that heavily contribute to greenhouse gasses being put into the air. In 2010 a study showed that 27% of the United States’ greenhouse gases are from cars and trucks. Trucks that transport a lot of foods

can heavily contribute to greenhouse gasses. (Federal). By using large trucks that transport food, it is heavily affecting the environment. By buying local it can help reduce greenhouse gases being released into the air.

Eating local food is healthier. Local food is a healthier option because it contains more nutrients. Any food that has to sit for a while loses nutrients, making it not as healthy. Nutrients provide nourishment that is essential for growth because it provides more nutrients (Amisson). Also, local food is picked at the peak of it being ripe, it is healthier. It is important to pick the healthiest food, and choosing to eat local consumers can be healthier than a non-local version of that same food.

Eating local has many advantages, but it also has some drawbacks. There are advantages to local food; it is healthier, it isn’t transported as far, and it supports the local economy. However, it also costs more, lacks variety and some local farms can be harmful to the environment. Many people are starting to eat local foods, and it can be beneficial, but is not always the best choice.

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# Have you been Eating the Wrong Snacks?? Smoothies vs Common snacks! Which is Best for You?

By Dallas Kelly

Smoothies are a delicious and healthy snack, but have you ever considered all the pros and cons of smoothies versus regular snacks? Choosing smoothies over different, regular snack options can be a tough decision considering all of the benefits and disadvantages. Everyone wants to have a healthy and balanced diet, but before deciding what to eat it's important to know the facts. In order to find the best snack food for a personalized diet, one must ask: is it better to eat blended foods or other snack foods when it comes to health, convenience, and affordability?

The digestion and nutritional benefits of blended foods are different from those of fruits and vegetables. The nutrients from smoothies are released differently than that of whole food. Also, the texture and form of smoothies change the separation and digestion of the food. When fruits and vegetables are eaten, cell walls are broken down so that the nutrients are released. By blending food, more of the cell walls are broken down allowing more nutrients to become available. Blending breaks down these walls more thoroughly than chewing does (Which). The digestion process is different for liquid foods and whole foods. When eating a whole meal with solids and liquids, the liquids tend to empty quicker. The stomach empties liquids faster because they usually do not have as many nutrients that must be processed, therefore the body has no reason for slow digestion. A blended meal slows down the digestion process because liquid food has calories and nutrients that must be broken down and absorbed. Also, meals that have less separation between liquid and solid, will stay in the consumer's stomach longer. The stomach and receptors slow down the process, which also means that through eating a smoothie the consumer is much more likely to stay satisfied longer because they would obtain all the calories and nutrients and have a slow emptying process (Which). There are many differences between blending fruits and vegetables and eating them raw.

Blending foods add a healthier variety to one's diet. One useful strategy is to blend less favorable foods into more appetizing foods. This is useful if there's healthy food that a person wants to eat but doesn't due to its unappealing taste. Blending also makes adding healthy food combinations easy. Most people don't get all the nutrition they need. There is usually a certain food they don't like that prevents them from getting its health benefits. When blending, it is effortless to include fruits, vegetables, nuts, juices, dairy products, or on rare occasions meats that may be less appealing. These foods' taste can be completely hidden depending on other ingredients. Also, if someone is convinced they don't have the time or motivation to eat their "leafy greens" or other foods, they can easily be blended into a smoothie (Systems).

Another way smoothies include healthier varieties is through food combos. One food combo is fats and carotenoid vegetables. These are vegetables that are dark green, orange, and red. When fats are included with these types of vegetables, it helps them get absorbed into the body. Another combo is citrusy or vitamin C filled fruits and vegetables with iron. These fruits and vegetables supposedly help absorb non-heme iron and works to prevent phytic acid which blocks iron from getting absorbed into the body. The final food combination is foods with oxalates-spinach, beets, strawberries, etc.- and dairy products. This food combo helps prevent kidney stones but it has been found to lower calcium levels, so there are benefits and disadvantages depending on the consumer and their diet (Jones). There are many opportunities to improve a diet by blending. It is also convenient because it is an easy way to have a balanced meal in one drink instead of a plate full of these foods.

While smoothies provide a beneficial variety of foods in one drink, they do have their downfalls. Overconsumption can become concerning when drinking smoothies. Due to the liquid nature, it is easy to consume lots

of calories. When drinking smoothies people don't always watch the calories and sugar they're taking in, which can be an issue even though the fruits, vegetables, nuts, and other foods are primarily healthy. The number of calories and sugars add up. It is excellent to have variety, but when making or consuming a smoothie it is easy to overlook the number of calories, sugars, fats, or proteins that are actually included. After a while, it becomes very likely one will over-consume their recommended daily limit of these nutrients. Also, because smoothies are in a liquid form, people can drink way too much too fast and then be overstuffed or feel sick. This is because if the time is not taken to slowly drink the smoothie, then the body will not know when it is full until it is exceedingly stuffed (What). When deciding between smoothies and whole foods it is important to heed the disadvantages and potential problems they can create.

When nutrition is taken into account, the price of smoothies is about equal to other snack options. The price of a smoothie made at home or one from a smoothie shop is almost the same price of an average eight bars box of granola bars. Although, granola bars are not as nutritious. For example, a smoothie for one person may consist of half an apple, half a banana, three frozen strawberries, two ounces of blueberries, and a quarter cup of milk would cost about one \$1.92 if the ingredients were bought at Price Chopper. The cost of a box of eight Quaker Chewy Granola Bars is \$3.49 and for each individual bar, it is about forty-four cents. The price of a 15oz bag of Chex Mix Snack Mix Traditional is \$3.29 and is about twenty-two cents per ounce. Cheez-it Crackers Original is \$4.54 a box and is around thirty-seven cents per ounce. Finally, a bag of Jack Link's Beef Jerky Original is \$5.99 (Price). When the cost is compared to the nutrition value of a smoothie versus a common snack food it is a fair price to pay for a healthy snack.

Smoothies as a snack food, have less of an environmental impact. This is because

# Soda Tax: Will it Change Anything?

By Esther Mary Parker

Did you know that in one 12 fl ounce can of Pepsi there are 41 grams of sugar, yet the average person is only supposed to consume 25 grams of sugar in a day? Every year the soda industry makes around \$7-8 Billion dollars from selling their soda (Hirsch) while Americans consume an average of 44.7 gallons of soda per year (Chan). If cities added a tax to soda, it could affect small business owners and big business owners like Pepsi-Co and Coca-Cola, who would potentially have to cut jobs(Annie). Although, if cities do have a soda tax it could help the obesity epidemic by cutting back on sugary drinks (Corliss). What are other health and economic advantages and disadvantages of taxing soda?

A soda tax could benefit the health of consumers because soda is linked to obesity, diabetes, heart disease, and bone health. A study by The Lancet showed that “each additional 12-ounce soda children consumed each day, the odds of becoming obese increased by 60% during a 1.5 year follow up” (Ludwig). Soda consumption is also related to type 2 diabetes. “People who generally drink one or two cans of soda had a 26% greater risk of developing type 2 diabetes” (Corliss). Soda has a lot of calories and sugar which leads to type 2 diabetes. “A study showed that 40,000 males who drank a sugar-filled beverage generally once a day had a 20% higher risk of having a heart attack or dying from a heart attack than men who rarely consumed sugary beverages” (Corliss). This is because of the high content of sugar in soda. Drinking soda can lead to unhealthy or brittle bones, because it contains too much phosphate. When people consume more phosphate than calcium their bones begin to break down. Soda also contributes to more diseases because they are empty calories which don't contain any nutrients. Other “unhealthy foods” like potato chips and sugary smoothies contain some amount of fiber or vitamins and minerals but soda lacks any other nutrients. Soda also doesn't satiate hunger as other snack food would. After a portion of most foods, the consumer feels full and stops eating that food but since soda is a liquid peo-

ple don't feel full and end up drinking more.

A soda tax is economically unfavorable because it might lead to lost jobs. Just one year after putting a tax on soda in Mexico more than 1,700 jobs were lost. According to Anprac, (The national soft drink producers in Mexico) “the tax ‘has had a negligible effect on reducing the calorie intake of Mexicans, but has had a series of adverse economic effects such as the direct loss of over 1,700 jobs” (1700). This is because the sale of soda decreased, making it more difficult for businesses to pay employees. In Baltimore, Maryland there's a 2 cent tax on soda containers, and soon after this tax was created “about 75 people lost their jobs” (Teamsters). In places like Mexico and Baltimore where a soda tax was implemented, people lost their jobs in the soda industry and small businesses. If people begin to stop buying soda, the businesses couldn't pay their employees which would result in lost jobs although this is just a few places.

Conversely, there is some evidence that a soda tax is effective to motivate consumers to cut back on consumption. In Berkeley after 3 years of having a soda tax it was reported that “water consumption surged 29 percent” (Rapaport). People start drinking more water can help you feel less hungry. Christina Roberto, a researcher at the Perelman School of Medicine at the University of Pennsylvania in Philadelphia, “Price hikes and help motivate consumers to change their unhealthy habits” (Rapaport). Much like soda tax, when there was a tax on cigarettes for the first time people began to smoke cigarettes less because they cost more. From 2005 to 2015 there was a 5.8% decrease in how many people smoked (Current). When an item costs more money fewer people want to buy it resulting in changing over to a new substance that could potentially be healthier (Charles).

In Mexico, they put a tax on soda in 2013 and “there was an average of 6 percent decrease in soda sales” (Sanger-Katz 2). According to the National Institute of Public Health, “a 10% tax should reduce that to 141

liters per year, preventing up to 630,000 cases of diabetes by 2030” (The Guardian).

A struggle with a regional tax is exemplified in Philadelphia. There, people have been going to other states to buy their sugar-filled drinks because it is cheaper. One NPR article stated that “We find a very large increase in sales in soda and other taxed products at stores that are located zero to four miles outside the city” (National). It is clear that a tax on soda has mixed results on lowering consumption if it is relatively easy to purchase the same product outside the tax zone.

If a soda tax does not reduce consumption, it is clear that it will not be helpful to the health of consumers because it will not affect obesity rates significantly. Another issue to be analyzed is that there are other high-sugar foods and drinks that contribute to obesity as well. “Many households reduce their soda consumption while purchasing an increased amount of beer, substituting one ‘vice’ for another” (Loughead). Even though people might be cutting back on their soda consumption, they get sugar and calories from another source like beer or apple juice, which can still lead to people being obese. There is also more to being obese than just soda consumption. In some cases, a tax has reduced people who were at risk of obesity but there are still other ways of keeping our obesity rates. It might be better to focus on people starting to exercise and make healthier food choices overall instead of merely putting a tax on soda.

Taxing soda could be helpful to motivate healthier drinking habits and reduce the risk of sugar-related diseases. However, people who sell beverages could lose their jobs. Also, there has not been a well-established link between soda taxes and reduced obesity rates and there are potentially more effective alternatives. Obesity is a concerning epidemic in the United States and a soda tax alone will not stop this epidemic, but it may be a tool to consider in conjunction with other strategies.

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# High Fructose Corn Syrup: the Enemy Within?

By Margaret Williams

Do you know how you and your health are affected by high fructose corn syrup? High fructose corn syrup (HFCS) was introduced in the 1970's as a corn-based sweetener. Since then, food industries have used it much more than regular sugar. The reasons are that it is cheaper, it is easiest to transport as a liquid, and it is subsidised. Obesity rates have gone up recently as well. There have been suspicions that this growing rate of obesity has something to do with HFCS and that it is unhealthy than regular sugar. As it turns out, this is not true. Americans are just consuming more of it than regular sugar.

How do companies make HFCS to put into food such as soda? A corn kernel is made out of four parts: the pericarp, the germ, the endosperm, and the tip cap. The endosperm, which is where most of the starch of the corn is found, is taken out and ground into a powder called cornstarch, which also contains glucose. It then goes through a complicated process involving enzymes where it first turns into corn syrup, and then high fructose corn syrup. This is how the fructose is added, which means that the corn syrup now contains 45% glucose and 55% fructose. "For example, while HFCS 90 — the most concentrated form — contains 90% fructose, the most commonly used type, HFCS 55, consists of 55% fructose and 42% glucose" (Leech). This is why HFCS is easy to put into food: scientists have found a way to turn corn into a liquid.

There has been a concern that HFCS is unhealthy than regular sugar, also known as sucrose, but HFCS has about the same amount of sugars as sucrose. Sucrose is 50% fructose and 50% glucose naturally, and HFCS has 45% glucose naturally and then has 50% fructose added. "Sucrose — better known as table sugar — is a 50-50 combination of fructose and glucose. The HFCS used in soda is supposed to contain no more than 55% fructose and 45% glucose, according to the Corn Refiners Assn" (Kaplan). This means that HFCS affects one's health the same way from a digestion standpoint as regular sugar

does because of the similar ratios.

As it turns out, having the right amount of sugar is fine and actually provides the body with energy so it can function, but having too much can lead to various types of diseases such as obesity, type 2 diabetes, and heart disease. "In a comprehensive 34-page review of research published in *Critical Reviews in Clinical Laboratory Sciences* in 2016, [a researcher] linked consumption of added sugar to metabolic disease — cardiovascular disease, Type 2 diabetes and nonalcoholic fatty liver disease — as well as high blood levels of uric acid, a risk factor for kidney stones and gout" (Brody). Since HFCS and sucrose have about the same amount of sugar, having too much corn syrup can lead to these diseases as well. Obesity is when an individual has too much sugar or fat and doesn't move or exercise enough to burn those calories. This can then lead to type 2 diabetes, which is when someone has too much blood glucose and their body doesn't make enough insulin to keep up with it. Type 2 diabetes can occur at any age, but it usually happens around the age of 45 or older, when individuals struggle with obesity, insulin resistance, or a genetic condition. This means that Americans should not only watch out for sugar/sucrose consumption, but also for how much HFCS is consumed. The recommended sugar consumption, according to the American Heart Association, is about 25 grams for women and about 37 grams for men.

Almost 40 percent of American adults were diagnosed with obesity in 2018, and this may be because HFCS's main ingredient is subsidised. Corn is a heavily subsidized crop in America. A subsidy is when the government gives a business or organization money to help produce a product. This means that many farmers and businesses grow corn as their main product. Since so much corn is grown, one of the ways that we use it is by turning it into HFCS. This is why businesses use HFCS as a sweetener instead of sucrose. Since HFCS is a sweetener in many sugary foods and drinks, and it is very cheap because

the subsidised corn has brought down its cost. Now, sugary and unhealthy foods are cheaper than other foods that do not contain corn or HFCS, such as healthy vegetables. "At the same time the government urges Americans to eat healthy foods, it heavily subsidizes farmers who produce corn and other crops used in junk foods, and invests little in those who grow fruits and vegetables. The result? A pound of fresh broccoli costs about \$2 in any supermarket, while a calorie- and fat-filled cheeseburger is half that price in many fast-food restaurants" (Mineo). This means that people, especially those who are struggling with poverty, might have to buy those cheaper and healthier foods, which could lead them to harmful diseases.

HFCS is found in many sugary foods in America as a more popular sweetener than sugar, also known as sucrose. But its make-up is almost identical. This means that HFCS and regular sugar affect your health the same way as well. Nevertheless, from a digestion standpoint, having too much can lead to harmful diseases such as obesity, Type 2 diabetes, and more. Americans have a high rate of consumption because of the corn companies lobbying the government to subsidize corn, which then makes the food containing HFCS cheaper. Companies and the government pushing HFCS do not just affect people eating food containing it and our health, it also affects corn farmers and everybody who pays taxes. If corn subsidies continue, so will the production of HFCS, and unhealthy food will continue to be cheaper than healthier food. Americans need to ask whether this policy should continue, because they have the power to demand that the government change it.

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# Grow Fast or Slow?

Conor Jarrait

Did you know that when you buy a carton of milk you might be getting a side of growth hormone? Recombinant Bovine Growth Hormone is a growth hormone fed to cows or injected into them to make them grow faster, as well as produce more milk. There are people who don't want farmers to use this hormone because they think it's harmful to human health. Other people think farmers should use it because it helps farmers make more money. rBGH was invented in 1981 by Monsanto and Genentech (Bovine). It took Monsanto and Genentech 12 years to finally be approved for use by the FDA. It became popular when a well-known dairy farm used it to increase profits. What are some disadvantages and advantages of using RBGH in dairy cows?

One disadvantage of using rBGH is that it can negatively affect a cow's health (Nicholson). It may give them mastitis, an udder infection (Nicholson). It also can create leg and hoof problems, as well as increase the possibility of lameness. "A meta-analysis of several studies, published by the Canadian Veterinary Medical Association, showed that while cows consumed more food daily while on rBGH, they nevertheless lost weight and displayed decreased overall health" (About). rBGH may cause bloating, indigestion, cystic ovaries, birth defects, and fetal loss (Nicholson). Using rBGH shows farmers care more about producing more milk and making money at a cost to the health of the cow.

Another disadvantage of using rBGH in dairy cattle is that it can negatively affect human health (Harkison). Scientist's studies have shown that RBGH can cause tumors and cancer in humans. About forty-four percent of stores in the U.S. have stopped selling milk that contains RBGH. Davaasambu, a scientist from Harvard, "found that milk consumption strongly correlated with rates of breast, ovarian, and uterine cancers in forty different countries" (Harkison). rBGH causes cancer because it increases the blood levels of growth hormone or IGF-1 in humans (What). Then when cells multiply quickly it

can cause cancer.

Farmers could stop using rBGH because there are safer alternatives. Cows can take vitamins that help increase their growth, these include vitamins A, B complex, F, D, and K (Bovine). If cows are given these vitamins they can have a healthier life as well as better nutrition. However, this process is more expensive for farmers because the cows take longer to grow and produce less milk than if they were given growth hormones.

Another advantage of rBGH is that farmers can make more money on their cows when they use it (Nicholson). rBGH makes cows produce milk three times faster, so farmers can sell the milk to make more profit (What). When farmers make more money, they can put food on the table and provide for their families. If dairy farms are going out of business, then farmers could use rBGH to get them more money to keep their farm going.

Clearly rBGH has advantages and disadvantages. The disadvantages are that it can be harmful to humans and animals, and there are alternatives. The advantages of using rBGH are that it makes money for farmers and can reduce the need for more cattle. If rBGH has negative consequences for human and cow health, why don't farmers stop using them? Would consumers be willing to pay more for milk if they knew it was free from rBGH?

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## McDonald's vs. Five Guys

McDonald's and Five Guys. Both chains struggle in some aspects, while in others they are definitely contributing to the well being of the general public. In terms of nutritional value, McDonald's takes the cake, as McDonald's generally provides healthier food in relation to Five Guys. Socially and environmentally, they were both fairly similar. Both chains use beef treated with antibiotics. Both chains buy meat from factory farms, that have been known for being inhumane and unsafe for the workers. The shipping practices of both chains cause negative impacts on the climate, although Five Guys has fewer carbon emissions since they ship less food because of their smaller chain size. Since 85 million people eat fast food daily, the practices of chains like Five Guys and McDonald's have a significant impact on animals, the environment, and people. Fast food is clearly not the best source of nutrients or energy, but it is cheap, and for some people, that's all that they can afford. But what needs to change in the system to allow people to get better food, and what has allowed fast food chains to get this much power in today's system? The only way these questions can be solved is if we take action, by encouraging chains to get rid of antibiotic filled beef and slim down the serving sizes. Although the actions may seem small, they can cause huge changes for the better. If we focus on those two main points, the chains may become healthier in many ways.

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## Coffee

iversity, and shade coffee plantations in Ethiopia have been shown to have up to 2.5 times as many birds as nearby forests (Howard). Using pesticides hurts the environment and the farmer, and it can drastically reduce soil quality to have only one crop in place over time. Shade-grown coffee creates biodiversity, and the birds keep pests away so the farmer doesn't need to spend money on pesticides.

In light of its environmental and social costs, is coffee a sustainable industry? The conventional methods of growing, processing, and shipping coffee are not environmentally sustainable, and other methods are not always available. Big corporations often exploit farmers and farmworkers, and they can't meet the cost of living. Most of America's coffee comes from companies like Nestlé, Kraft, Sarah Lee, and Proctor and Gamble. These companies have lots of power, and they can easily take advantage of poor, small scale farmers who don't have contracts or unions. In addition, these workers often struggle for money, and

so it is difficult to pursue more environmentally friendly options.

However, this doesn't mean that all coffee is bad, or that people shouldn't drink it. One organization that tries to combat the negative social and environmental aspects of coffee producing is Fairtrade America. Their mission is to help farmers by ensuring a minimum price for their coffee, giving farmers access to finance and credit, and enforcing the Hired Labor Standard, which details that workers must be provided with wages, leave, social security, and formal contracts. Fairtrade helps farmers to change their practices to be more environmentally friendly. All certified Fairtrade farmers have to meet certain environmental standards, and they offer a premium to farmers who switch to organic (Why). This isn't a perfect solution, since Fairtrade coffee is more expensive and not everyone can afford it, but it does help. Consumers need to appreciate the social and environmental impacts of the coffee they are buying, in order to begin improving the industry for the farmers and

the environment.

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## Flowers

lot of money to tear down the flower farms and nobody would be able to afford it. Workers on flower farms are becoming sick because of the chemicals that are being sprayed on the flowers. America is supporting large flower farming operations in South America. Would American consumers be better off buying local organic flowers instead? Is there a way that South America can close flower farms without affecting the yearly income of the country?

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# Slaughter laws in Vermont and why they were created

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Have you ever wondered how the meat you eat was treated before it was slaughtered? Have you ever wondered where and how the meat was slaughtered? This issue is important to farmers, because they are the ones who raise the livestock, as well as the slaughterhouses, who slaughter the animals. Consumers want to know that the meat they purchase has been treated well, and is free of contaminants. Why were the Vermont slaughter laws created in the first place, and are they effective?

One of the reasons that the Vermont slaughter laws were created was to ensure that animals being brought to slaughter were treated humanely. This law is also referred to as the Humane Animal Laws. The Vermont law states that, “No slaughterer, packer, or stockyard operator may bleed or slaughter livestock except by a humane method. The use of a manually operated hammer, sledge, poleax, or similar instrument is not a humane method” (Vermont State Legislature). The

animal must also be made insensible to pain before being slaughtered. This law was probably created to please the public, because who wants to eat meat that was used in the process of being killed?

There are other laws that regulate the building or slaughterhouse where the slaughter occurs. These laws were created to ensure that the meat is not contaminated and that the consumers will not get sick. The law requires that the slaughter occurs under sanitary conditions. The slaughter facility must also be inspected by the Secretary of the State. These laws were designed to keep disease and sickness from spreading.

Vermont’s laws also limit the spread of contaminants or diseases between farms. These laws were made to ensure that contaminants don’t spread. If a farmer sells an animal to be slaughtered, and the animal is diseased, then the disease would spread to other livestock animals. Therefore, the law states that the slaughter can only occur on the farmer’s

land. This prevents the spread of diseases between farms.

There are also laws regulating where the meat can be sold. These laws were created to ensure that diseases don’t spread to consumers. If the animal was sold to be slaughtered and was slaughtered on the farm, the meat must be halved or quartered and it may only be used for the farmer’s personal uses, as the animal was most likely raised for slaughter by that farmer. If the animal is slaughtered in a custom facility or a slaughterhouse located on the farm, it can only be used for the personal uses of the farmer, his or her co-workers, and his or her family. The meat must be stamped “not for sale”. The custom facility must be inspected and approved by the Vermont Agency of Agriculture, Food, and Markets. To pass the inspection, the facility must have clean walls and floors, hot and cold running water, a good amount of light, ventilation, plumbing, and sewage disposal. If the animal is slaughtered at a USDA inspected facility, then

## Organic vs Local

er knows that organic food is pesticide and GMO-free thanks to national regulations, and it is more accessible because it’s sold in big box stores. Compared to organic food, local food is higher in nutrition, its transportation has less of an effect on the environment, and it is likely a more frugal choice. If the food industry made the regulations for organic food also apply to local food, it might be beneficial in that it would allow consumers to have healthy and affordable food with a smaller carbon footprint, and fewer pesticides. However, these regulations might unintentionally increase the price of local foods.

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## Bees

is the public planting pollinator-friendly gardens that are rich in nectar and pollen (some of these plants include lilac, lavender, sunflowers, and honeysuckle). And though it seems as though banning pesticides is entirely in the government's hands, citizens can help with that too. According to author Amadeo, "The only way to protect the bees is to encourage Congress to ban these pesticides." So, while it seems as though the solution to this crisis is completely out of the people's control, everyone can help. By growing pollinator-friendly gardens and participating in the anti-pesticide movement, people can help save the bees in their own backyards.

Colony Collapse Disorder affects consumers and nature in negative ways, though there

are many solutions to this issue. CCD affects the environment and economy because honey bees are major pollinators both in nature and for agricultural crops. Some solutions include banning pesticides and using prevention materials, and consumers can help by growing pollinator-friendly gardens and encouraging the government to take action. If people manage to stop the effects of Colony Collapse, the bees will be safe, and so will the American food supply and the environment. People won't have to worry about losing a third of their diets in only 15 years, and plants will not suffer from the loss of a major pollinator. However, this will require action as a country, and as the world. Is humanity ready for that, or will established farming practices stop

us from solving a problem with disastrous implications?

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## Chocolate

that affect their growth and health. When people are buying non-fairtrade chocolate, they are supporting an industry that takes kids out of school to work on these farms. Would consumers be willing to pay more money to buy fair trade chocolate?

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## Pizza

school lunches use tomato paste rather than diluted sauces with sugar and fat additives, it makes some sense to count the paste as a vegetable serving. However, because of the obesity problem in America, it would be best to serve plain fresh vegetables prepared in ways that appeal to children, rather than by increasing calories by serving pizza as a vegetable.

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## Food Insecurity

on SNAP benefits, they're not getting enough money to pay for the food they need. This is a consequence of stretching one's money and buying cheap and unhealthy foods. Secondly, "generally, able-bodied adults aged 18 to 50 who do not have children and aren't pregnant can only get SNAP benefits for 3 months in a 3 year period" (Facts). Minimum wage jobs are not enough to keep residents from becoming food insecure. While SNAP benefits start to address the issue of food insecurity, these benefits don't go as far in helping low-income Vermonters get back onto their feet as much as people might assume they do.

There's much that Vermonters can do to address the problem of food insecurity. In Vermont communities, residents can create food shelves, community dinners, and food drives as a temporary helping system (The Red). This will help food-insecure people in Vermont because it will give them one source of food they can depend on.

There are other ways Vermonters can help by appealing to the government. For example, someone can petition the Vermont Legislature and our United States Government to increase benefits for the SNAP program so people can afford nutritious food (Resources). Vermonters can create programs for people who cannot afford higher education so that they can receive the education they need to be successful and succeed with a well-paying job (Resources). In addition to this, we could raise the minimum wage to a living wage so people can pay all of their expenses. In Vermont, our minimum wage has been increasing from \$8.06 in 2009 to \$10.97 in 2020 (Bakuli). There are a few groups of people in Vermont working to raise the minimum wage to a living wage. One of these groups is called "Vermont Raise the Wage coalition" (Vermonters). This organization is composed of more than 30 Community Statewide and works to increase the state's minimum wage to cover the cost of living by 2024 (Vermonters). This is just one example of how a group of people in this state are working to fight food insecurity.

In Vermont, many people are impacted by food insecurity. Especially children, people without an education, lower-income families, people in food deserts, without transportation, and people using the SNAP program. Due to the concern with food insecurity in Vermont, communities are trying to find ways to help people who are struggling. While community measures make some differences, government changes will be wider reaching. Since food insecurity is such a problem, why hasn't the United States government representatives increased support for food insecurity programs? Have the people that make laws for Vermont ever experienced food insecurity? What can Vermonters do to give people with food insecurity a chance to share their voices and their experiences?

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## Natural Flavors

*continued from page 1*

dangerous, along with consumers having no clue about how much processing natural flavors go through, or what unsettling origin points some of those compounds come from, including castoreum. This doesn't mean that the flavor industry has been trying to deceive consumers, but one may never know to the extent manufacturers might abuse this power.

Natural flavors may not be much better for the consumer than artificial flavors, as there is little variation between the two. In fact, natural flavors tend to be more complex than artificial flavors because they use more preservatives and flavor enhancers than artificial flavors (Andrews). The flavors are meant to be powerful, pungent, and preserved well enough to taste fresh long after the actual product would have gone rancid. Although artificial flavors do not use safer or healthier chemicals than natural flavors do, there are just fewer of them. Many artificial flavors and their additives have been banned over the years from usage in processed foods, and some have continued to be produced in small quantities after their termination (Choi). Even with the banned ingredients, not every potentially harmful ingredient has been outlawed from incorporation in food due to low concentrations, yet couldn't that still make an impact on a consumer and their health?

Another health concern related to natural flavors is that the only purpose of natural and artificial flavors alike is to create a short-lived, addictive taste. "Food products are flavored to increase sales by making mouth-watering tastes, making packaged food taste fresh, giving processed food a bolder taste

than a comparable natural food and making the taste short-lived so

that the consumer wants to eat more" (Andrews). An interview from 2011 with Morley Safer of 60 Minutes and two flavor scientists from Givaudan talked about how one of their goals was making food addictive (Andrews). Givaudan is one of the top flavor manufacturers along with Firmenich, IFF, and Symrise. Collectively, the companies make roughly \$13,209,221,010 a year. If all that these huge companies care about is getting the right flavor to make as much money as possible from consumers, is there any way to guess if they care about the well-being of those who will soon be eating the flavors that they manufactured? One upside to natural flavors is that they contribute no nutritional value to the product as a whole. While this isn't a good thing in most cases, consumers can enjoy flavorful food without also having extra empty calories or tipping over their daily limit of certain nutrients. This is one of the reasons that has made seltzer such a desirable option for those looking to change their drinking habits which has started to help cut down on diabetes and other health issues in the country. If natural flavors had calories, carbohydrates, extra sugars, or sodium, there would be less demand for these products (Marikar). "Americans spent about \$1.7 billion on sparkling water at restaurants in 2018, a modest amount compared with the \$15 billion they forked over for carbonated soft drinks. But while sparkling water is seeing double-digit growth, by those estimates, traditional soda has grown by only 1 percent each year since 2016" (Marikar). Natural flavors

are used to produce a taste for consumers to enjoy without gaining more calories than they need.

Whether natural flavors are healthy or not, the purpose of any flavor is to provide the consumer with an enjoyable, strong taste to last until their next bite. On closer analysis, natural flavors may not be all that healthy and are much closer to artificial flavors than many may have thought. Although there are some restrictions set by the government, natural flavors are still a mystery that many people have not yet discovered the extent to which it affects them. The number of chemicals and some of their origins have been a bit unsettling, and they could have many potential negative effects on consumers. So if the natural flavors can be this misleading, why don't companies find better ways to flavor our food and beverages? Could the tradeoff of not having calories or sugar be worth drinking highly processed ingredients? If the truth about natural flavors made it out into the public, would consumers start to look at processed foods more cautiously? Or would flavor manufacturers need to experience a reduction in sales for them to think about switching to better, less artificial methods to flavor food?

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## CAFOs

*continued from page 3*

is made off of pigs when they are corraised in hoop barns rather than CAFOs. Beef and dairy cows could go outside and be on a pasture grazing for alfalfa hay. This is much better because it is healthier for the consumer and the environment. It has a smaller carbon footprint because grain takes fossil fuels to process and fields don't (Profita). It is also healthier for the cows because eating grass is more natural for them and it provides healthier meat (Profita). With this alternative, cows would have to be moved into paddocks for a little while so that the hay and grass can grow back. Another benefit of this approach is that it has a lower risk of manure runoff because the manure is much more spread out. When it is more spread out it is able to decompose faster so then more grass and hay can grow for the cows. For cows, hoop barns could also be a solution (Gurian-Sherman). The hoop barns may be a little more costly than a CAFO, but it would solve the manure problem and the animals would be able to be outside, which is more humane and often produces

## Hershey's chocolate

sustainable cocoa in all their chocolate. Even though Hershey's company has some questionable practices, they are trying to become a better, more eco-friendly chocolate producer.

There are many aspects of Hershey's chocolate bars production that make it unsustainable. The way Hershey's grows cacao beans and sources its milk raises concerns about environmental practices. Moreover, the people who farm the cacao beans work in unacceptable conditions and do not earn a livable wage. On the other hand, Hershey's puts some of its profits to acceptable causes and their factories are environmentally friendly.

more nutrient-dense meat.

Overall, there are many concerns about CAFOs and their impact on the environment, workers, and animals. CAFOs do provide jobs and cheap meat and dairy but aren't environmentally or animal-friendly. Even though they are regulated, workers' abusive treatment towards animals is often overlooked. Considering all issues with CAFOs, why don't we use alternative ways of raising animals? Switching to alternatives could help the animals, the environment, and consumers. However, for alternatives to be viable, we need to reduce America's demand for cheap and plentiful meat. Would people be willing to pay more and eat less meat for the sake of the animals and the environment?

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## Burgers

bitten, kicked, and pinned between cattle. “Nearly, one-third of workers had experienced an occupational injury, mainly due to animal handling” (Self-Reported). Workers reported other occupational health issues such as burning eyes, muscular pain, headaches, coughing, nausea, and nasal congestion. Workers are exposed to harsh chemicals like hydrogen sulfide and ammonia which are bad for the workers’ health (Mitloehner).

Another issue with the beef industry is that the slaughtering process is not the most humane for cattle. Michael Pollan, an American journalist says, “cows pass through a station where there’s a man on the catwalk above. He’s holding an object that looks like a power nailing gun or something. It’s a pneumatic device called a stunner. This essentially injects a metal bolt. It’s about the size and length of a thick pencil into its brain, right between the eyes, and that should render the animal brain dead” (Pollan). Cattle will then have chains hooked to their rear legs and will be put on an overhead trolley where they will be bled. “Another person in another station will stick a long knife in and cut his aorta and bleed the animal” (Pollan). While this process is fast and easy, many consider it inhumane for the cattle. However, the slaughter industry has adopted many practices to try to make the process less traumatic for cattle. According to Dr. Temple Grandin, professor of animal science at Colorado State University, using curved chutes shield cattle from viewing what’s ahead, which keeps them calm (Bell). Another method Grandin says is better is a conveyor belt-like system that lifts the cattle and keeps them steady during their final moments before death (Bell). While slaughterhouses might seem inhumane, they are working to improve their methods.

Just as CAFOs are dangerous for workers, slaughterhouses can also lead to worker injury and sometimes death. Pollan explains, “The slaughterhouses that the United States have are pretty unique in terms of the speed of production. We have slaughterhouses that will process 300, 400 cattle an hour, which is as much as twice as many as anywhere else

in the world” (Pollan). Working at such fast speeds leads to serious injuries such as carpal tunnel syndrome from repetitive movement. “Seventy-six percent of workers in a Maryland plant had abnormal nerve conditions in at least one hand” (Lowe). If a worker cuts themselves, they can’t stop working to treat the wound because of the assembly line system of slaughtering, so they are more prone to infections.

When buying beef from companies, you support all the ways they treat the cattle, workers, and the environment. Considering all issues in the beef industry, people might want to consider not buying meat from these large companies. Buying from local farmers might be a better alternative if consumers are concerned with how the cows are raised, what they are fed, and how workers are treated. However, buying local beef is generally more expensive and might not be an option for many people. What can be done to make local beef more affordable and accessible to reduce our consumption of factory beef?

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the meat may be sold in stores. The USDA facility must have a USDA inspector present at all times (On-Farm Slaughter).

The number of livestock that can be slaughtered a year is regulated by laws in Vermont. These laws ensure that there is no waste of livestock meat. A farmer can only slaughter 15 swine, 5 cattle, 40 sheep or goats, and/or any combination of these animals, as long as no more than 6,000 pounds of livestock per year (On-Farm Slaughter).

These laws seem to be efficient, for there have only been two violations in the last decade that we know of. The first violation occurred in 2017. The North Springfield Slaughterhouse was charged with six counts of violating the Humane Animal Laws and had to pay a \$1,500 fine (VT Digger). The second violation was in 2018 when a slaughterhouse in Springfield, Vermont was charged with two counts of breaking the Humane Animal Laws. However, most Vermont Slaughterhouses follow the Vermont laws and produce humanely slaughtered, contamination-free meat.

Are these Vermont slaughter laws actually effective? These are just some questions that may remain. The laws were created to prevent the spread of diseases, as well as ensure that livestock is treated fairly. Most slaughterhouses follow the law and provide consumers with meat from the animals that were treated well and are safe to eat. On the whole, Vermonters can feel confident when they purchase meat raised and slaughtered in their state.

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duce.

Aunt Jemima is cheaper and more accessible than maple syrup. This is because it's produced and distributed by the PepsiCo company. An ounce of Aunt Jemima Original Syrup costs only 12 cents. Real maple syrup costs \$0.75 per ounce, while this may not seem like a lot, if one brings up the amount of syrup to a quart, a quart of maple syrup would cost around \$24 (Vermont). For a quart of Aunt Jemima, the consumer needs just \$3.84 (SydAlex). That means for the price of one quart of maple syrup the consumer can buy 6 quarts of Aunt Jemima. Aunt Jemima is distributed all across America through PepsiCo. PepsiCo has a large presence in over 200 countries (PepsiCo). Maple syrup, on the other hand, has a much smaller area of distribution due to not being owned by huge food conglomerates..

Is it worth the cost of buying real maple syrup considering it has a higher price, and positive health and environmental benefits? Maple syrup affects the environment, but not as heavily as Aunt Jemima. Aunt Jemima is a less healthy choice than maple syrup, but it is more accessible and more cost-effective. This question is important because high fructose corn syrup in foods contributes to obesity. So why don't you vote with your dollar and start taking down high fructose corn syrup one food at a time?

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McNuggets can lead to many different health concerns. Between the growth, sodium phosphate, high levels of saturated fats, sodium, and cholesterol, Chicken McNuggets are not very healthy. If people are consuming McNuggets, and if the consumers know the health risks, then why do they keep eating them? Chicken Nuggets won't instantly have a negative effect on a consumer if they eat McNuggets every once in a while, but regular consumption can lead to negative health concerns. Would consumers would even stop eating Chicken McNuggets if they knew what could happen to them if they continued to eat them? Consumers might not know what they are putting into their bodies when they consume Chicken McNuggets, but hopefully they know more now.

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# Is Bacon Worth It ?

Kyle Radicioni and Pam Ward

Americans love their bacon, but do they know what it takes to make those crispy, salty strips of yumminess? More than 1.7 billion pounds of bacon are consumed each year in the United States (The). That is about 18 lbs of bacon per person per year and shows how much Americans love bacon. But would consumers feel the same way if they knew the conditions on the farms that raise the pigs and the additives that are added to the meat?

The first stage of the production of bacon is raising the pig. Smithfield Farms is the largest producer of pork in the US. In 2016 they raised and slaughtered 15.6 million pigs (Smithfieldfoods). It makes sense to look at the conditions for Smithfield raised pigs to understand how most pigs are raised for bacon. Pregnancy lasts 114 days during which time sows are put in gestation crates. After pregnancy the mother and babies are moved to farrowing crates to nurse for about 21 days. In both of these kinds of crates the sows have no room to the point where the pigs can't even turn around. Smithfield agreed to stop using these crates by 2022, but right now they are still in use at least in some factories. Male piglets get their testicals cut off in the first few days of being born which allows for better meat production. The sow is slaughtered after 5 years because her teats are all worn out and she can't produce milk. In that amount of time she will have had 4 to 7 pregnancies, and so has potentially spent all that time in gestation and farrowing crates.

After weaning piglets are moved to a nursery or barn with other piglets and are fed about 4 pounds of corn/soybean per day for 6-8 weeks. During that period of time they get their tails and teeth clipped to prevent them from injuring each other (Life). Then pigs are moved to the finishing barns where they consume 6-10 pounds of feed daily. Here these pigs are kept on concrete slats for the poop to just fall through. This can cause joint inflammation. Also, on concrete slabs the pigs are not getting mud or anything else to scratch around in which pigs enjoy. They stay in these pens for about three more

months. At about 6 months old they weigh about 280 pounds and are considered market ready (Life).

Another event that happens in the life of pigs on their way to becoming bacon is they are given antibiotics. This is because pigs are raised in crowded conditions where disease spreads fast. This use of antibiotics in pig farming is a problem because it leads to antibiotic resistance of bacteria that affect humans as well as pigs. Antibiotic resistance is one of the greatest health problems around the world. Two million Americans each year are infected by drug resistant bacteria resulting in more than 23,000 deaths. This is in part caused by the unnecessary use of medically important antibiotics, in U.S. livestock production including by the pork industry (Willinga).

An additional part of the process of producing bacon is slaughtering the pigs. Pigs, if raised in good conditions, have a life expectancy of 10-15 years. Industrial pigs used for bacon live for 6 months before they are slaughtered (The). According to PETA, an animal rights organization, factory pigs are transported in crowded trucks. To get them into the truck they use electric prods and a stick to whack them on their noses or backs. In the trucks they have trouble getting air and have no food or water and they suffer from temperature extremes (Slaughterhouses). Farmers say that 1% of the pigs being shipped fail to make it to the slaughter houses alive (Life). Prior to slaughtering, the hogs are stunned. This is usually done with carbon dioxide. The animals are unconscious after 10 seconds if everything works well. Until then they panic due to fear of suffocation and no possibility of escape. And if they're unlucky the pigs wake up after their CO2 stun (Slaughterhouses) Either way, next they are hooked up and their carotid artery slit through. Lastly they are cut and packed for sale (Life). The way that they are treated in the slaughtering process can be cruel and factory-like, not considering that pigs are living things rather than objects.

The last stage of making bacon is the processing of the bacon. The processing adds additives to the meat and requires more energy than if the pork was sold without processing it into bacon. After the pig is slaughtered the carcass is broken down into several different sections. One of those sections is the belly which is a flat rectangular section (Bacon). "The bellies could be sold at this point in the process and would be marketed as pork belly or fresh pork belly" (Bacon). For bacon this section must be trimmed to be straight on all sides to provide the uniformity to the bacon (Bacon). Next the trimmed bellies are cured. Curing is a process that used to keep meat from spoiling, but is no longer necessary because of refrigeration. Now curing is done to produce a unique flavor. Injected into the pork belly is a mixture of water, sodium nitrite, salt and sugar (Bacon). Once the curing is done the bellies are hung on a large rack for about a week so the cured flavor can develop. After this, the bellies are put into a large smokers to further enhance the flavor. These smokers run at very hot temperatures. Once the product has cooled down it is pressed into rectangular molds and refrigerated to make slicing easier. Then it is sent through the slicer. The last steps are packaging and distributing to grocery stores (Bacon). Even though the meat could be sold as pork bellies, to make bacon requires further steps and adds additional energy use. It requires high heat, cooling, slicing and molding - all steps which take energy, making bacon a higher energy process than just eating plain pork belly.

In summary, although bacon is certainly delicious there are many aspects to bacon that are negative. The commercial raising and slaughtering of the pig is an unhappy and unnatural process for the pig, and contributes to the problem of antibiotic resistance. Processing the pork bellies for bacon has a greater environmental impact than just eating the pork bellies. It would be sad to never eat bacon. However, consumers should eat only small amounts to help pigs, the environment,

most snack foods use lots of plastic packaging. Plastic packaging makes up a large percentage of our landfills. “Together, food and packaging/containers account for almost 45% of the materials landfilled in the United States, and some of these discarded materials are food-related packaging and containers” (Reducing). There is a tremendous amount of waste caused by food wrappers. Smoothies are not as wasteful. Most of the containers used to blend smoothies are reusable. For example, the NUTRIBULLET blender cup is machine washer safe. It can be reused for a countless number of smoothies (The). Smoothies do not harm the earth as much as the majority of alternative snack foods because they require less packaging and wasteful containers. Smoothies are an easy and convenient way to keep waste down and the earth healthy.

Are smoothies or an average snack food better and more convenient for those looking for a healthier diet? Overall smoothies have a higher nutrition value and they incorporate healthier foods. Although, there are disadvantages when it comes to watching calories, sugars, and rapid consumption. When it comes to convenience and affordability, smoothies

are a healthy choice for a quick snack, and the costs of smoothies are higher but not by a lot. Finally, smoothies are better for the environment. When deciding between snacks it’s useful to know all the facts. Consumers should get to know their options before deciding what’s best. These points should be considered as consumers try to figure out the best diet.

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# Are Farmed Fish Better Than Wild Fish?

By Austin Gendron and Pam Ward

Have you ever wondered what the difference is between wild fish and farmed fish? If you were grocery shopping would you know which one to purchase? Fish farming is growing very quickly around the world. The most common type of fish farming is in net pens or cages anchored to the seafloor in the ocean near a coast. There are also other methods that involve closed systems of tanks or ponds that either float on water or operate on land (Cho). The Food and Agriculture Organization of the United Nations predicts that by the year 2030 fish farming will provide about two-thirds of the fish eaten around the world (Cho). Wild fish are another source of fish and are commercially caught from the ocean and other bodies of water in various ways. These include long lines of baited hooks which are dragged behind boats, gill nets which are large nets that are held upright by floats and bottom trolling with large bagged shaped nets which are also dragged behind boats (Commercial). What are the benefits and disadvantages of fish raised on farms versus fish caught from the wild?

Farmed fish are almost always less expensive than wild fish. This is because it is harder to get the fish from the sea or bodies of freshwater rather than from a controlled farm. Farm-raised fish are bred to make fish cheaper and more readily available to consumers. As it stands, farm-raised fish make up about 90% of the fish consumption within the US (What's). Because farm-raised fish are lower in price, people on a low income might be able to purchase fish to eat. This benefits consumers because fish are a healthy source of protein and could be consumed instead of fattier meats. The lower cost of farmed fish has the benefit to the consumer of being less expensive in general than wild-caught fish.

Both farmed and wild fish are nutritious. If fish comes from a high-quality producer, it will be full of protein, healthy polyunsaturated fats, and essential vitamins (Team).

However, there is at least one species of fish that has some nutritional differences between the wild and farmed varieties. Farmed

salmon, has more fat and fewer minerals than wild salmon, although the protein amount is the same. Farm-raised salmon are fed highly processed food to make them grow fast whereas wild salmon eat other fish. These different diets make a difference in the fat and mineral content of the two varieties of salmon (Leech). Farmed Salmon is significantly more fatty than wild salmon. For example, 198 grams (half of a fillet) of farmed salmon has 27 grams of fat as compared to 13 grams in the same size piece of wild salmon. Farm salmon has 1944 mg of omega-6 fatty acid as opposed to 341mg in wild salmon. However, farmed salmon has 4.2 grams of omega-3 fatty acid while wild salmon has 3.4 grams of omega-3 (Leech).

A way the environment is negatively impacted by fish farming is by the waste that spills out of the fishnets causing nutrient pollution that depletes oxygen in the water, stressing or killing aquatic animals (Cho). Also, antibiotics and other chemicals used on farmed fish wind up on the seafloor where they can negatively affect biodiversity. Furthermore, crowded fish in fish farms can stress the fish and make them more susceptible to disease and parasites (Ganzler).

One obvious and good environmental reason to farm fish is that it takes the strain off the fishing of wild populations of the same species that is caused by catching wild fish. However, there are some definite downsides. Farmed fish waste can escape and hurt the environment by causing nutrient pollution. Also, smaller fish are fished to their limits for fishmeal. In addition, antibiotics leak from nets and get into native fish. Both methods of catching fish for human consumption have their environmental problems.

Another way to compare farmed and wild fish is to look at the contaminant levels of harmful substances to human health that is in the fish's flesh. Some sources say that farmed fish have fewer contaminants than wild fish but this is not completely accurate. Contaminants in fish are related to the environment where they are raised, because contaminants

in the environment get into the flesh of the fish (Leech). An article in Environmental Research which reviews many studies looking at contaminant levels in wild versus farmed fish concluded that "contaminant levels of dioxins, PCBs, OCPs (DDT, dieldrin, lindane, chlordane, Mirex, and toxaphene, and mercury were higher in wild salmon than in farmed salmon" (Lundebye). However, other studies showed that farmed salmon had higher levels of these same contaminants than wild salmon (Leech). "Anyone concerned about contamination issues should try to find out where their fish came from and read about any potential problems in that area," says a reporter from CNN trying to advise people about this issue (Landau).

Both wild and farmed fish have benefits and also definite downsides. Farmed fish tend to be cheaper, but beyond that advantage, it is difficult to claim that there are clear cut benefits to either type of fish. Nutrition is high in both types of fish although wild salmon is slightly better in providing Omega-3. There is no clear cut evidence that either farmed fish or wild fish contain less harmful contaminants. Commercially raised or caught fish are both responsible for negative environmental impacts. Consumers of fish can make more informed choices about the fish they eat. There are groups who provide current data concerning the choice between wild fish or farmed fish of specific species raised or caught in specific locations (Seafood).

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# Shopping Bags: Paper or Plastic?

Heikke Tans

Did you know that annually, a trillion plastic bags are used worldwide? You may not be aware that the type of bag you use at the store has an effect on our environment. In fact, everything from manufacturing, to how it gets to the store is affecting the environment. “The first version of the paper bag, invented by Francis Wolle in the early 1850s, was an envelope-shaped bag, which was limited in terms of its durability and amount of interior space” (Flat) A woman named Margaret E. Knight didn’t like this design, so she made a machine that could manufacture a bag with a square bottom that could stand upright (Flat). In 1965, The one-piece polyethylene shopping bag was patented by the Swedish company Celloplast. Designed by engineer Sten Gustaf Thulin, the plastic bag quickly begins to replace cloth and plastic [Sic] in Europe” (From) What are the environmental advantages and disadvantages of paper versus plastic bags?

One of the environmental disadvantages of paper bags is that they contribute to deforestation. This is because trees must be cut down in order to produce the raw material for the bags. According to Penn State University, “Americans use around 10 billion paper bags each year, which is equal to cutting 14 million trees each year.” (Preserve) An article by The World Wildlife Fund said, “Many animals also rely on forests. Eighty percent of the world’s land-based species, such as elephants and rhinos, live in forests.” (Deforestation). Another article by the WWF said that South America, South-East Asia and some parts of Africa are suffering from deforestation. Deforestation hurts the environment because using so many paper bags and cutting down so many trees to make them is destroying the planet. Trees help keep enough oxygen in the atmosphere so that humans and animals can survive. By destroying forests, people are also destroying animal habitats. Some of these habitats are being lost to wildfires caused by deforestation. “3,769 square miles of Brazilian Amazon rainforest were lost to deforestation in a 12-month period ending

in July (2019). That marks the highest rate of deforestation since 2008” (Dwyer). The soaring deforestation rates are a major cause for last year’s 80% leap over the previous year in the number of wildfires that had erupted across the country.

Another environmental disadvantage of paper bags is the number of fossil fuels and water used to manufacture them. An article by reason.org said, “Manufacturing 100 million paper bags with one-third post-consumer recycled content requires petroleum energy inputs equivalent to approximately 15,100 barrels of oil plus additional inputs from other energy sources including hydroelectric power, nuclear energy, and wood waste” (Paper Grocery). Each paper bag uses about one gallon of water, so if one million bags are made that’s one million gallons of water also being used (Paper Grocery). This causes a negative impact on the environment because manufacturing the bags uses an enormous amount of water. In making paper, “water is used in all major process stages, including raw materials preparation (e.g., pulping and bleaching) and paper machines (e.g., pulp slurry dilution and fabric showers). Water is also used for cooling, materials transport, equipment cleaning, general facilities operations, and to generate steam for use in both thermal and mechanical processes as well as on-site electricity generation” (Water). The production of paper requires a large amount of electricity and oil. This begins in the forest with the machinery to cut the trees, transporting the logs, then moving them through a long series of heavy machinery which all need fuel and electricity to run (Paper). Industrial use of water can often cause water pollution when the water is discharged after it’s used. It also could be being used for human consumption or another worthy use. The use of oil causes greenhouse gases to enter the atmosphere which will contribute to climate change. So, paper bags made for the grocery store have a negative impact on water resources and use oil which produces greenhouse gases.

While both paper and plastic bags require a lot of energy to produce, plastic uses less than paper. Energy (typically produced by fossil fuels) has to be used to make paper and plastic bags because that’s how company’s power their production (Life). It has been reported that it takes around 728 kilowatts to make 1000 paper bags but only 212 kilowatts to make 1000 plastic bags. The amount of energy the paper bags required for production is just under what the average American house uses in a month (900 kilowatts), whereas plastic bag production equals around a weeks worth of energy. Plastic uses so much less energy than paper because the process to make them involves fewer steps. Paper bags require that trees are cut down, shipped to the factory and processed through many machines whereas plastic bags need fewer raw materials and fewer machines.

Both bags can be reused and recycled; however, there are drawbacks to each. Paper bags are biodegradable, but the process of recycling them requires energy. On the other hand, plastic bags require less energy to be recycled, but they don’t biodegrade. Research by the Northern Ireland Assembly found that, “It takes 91% less energy to recycle a pound of plastic than it takes to recycle a pound of paper” (McGrath). They also found that .8 tons of oil are saved for every ton of recycled polythene produced. This shows that while both bags can be reused and recycled, it isn’t just as easy as throwing them into the recycling bin. “Depending on the paper mill, it may take more fossil fuel to make a recycled bag than a new one... That’s because many mills use energy from wood byproducts to manufacture new bags.” However plastic bags don’t often get recycled. When they do they can get stuck in recycling machinery that wasn’t designed for them. Even with the problems plastic bags have at the recycling plant, they do seem to beat paper in efficiency. Making a paper bag consumes four times as much energy as making a plastic bag. The production of paper bags uses three times the amount of water it takes to make plastic

bags. The process of recycling paper can be inefficient -- often consuming more fuel than it would take to make a new bag.

An additional advantage of the plastic bag is that starch can be added to the bag to make it biodegradable, an improvement made in the 1980's. According to [worldcentric.org](http://worldcentric.org), biodegradable plastic bags use about 25% less energy to make than regular plastic bags (Making). Biodegradable bags have some success in cutting down on energy use and litter. This is an advantage to the plastic bag because it will be better for the environment if it can biodegrade. This can only happen where there is sunlight and oxygen though, so if one of these bags is in a landfill, they won't break down for a very long time. Also, biodegradable and compostable plastics are not intended for recycling and can contaminate and disrupt the recycling stream if inter-mixed with petroleum-based plastics that are non-compostable. "Five plastic bag materials found in UK shops were tested to see what happens to them in environments where they can appear if littered. They all disintegrated into fragments after exposure to air for nine months. But after more than three years in soil or sea, three of the materials, including biodegradable bags, were still intact" (Biodegradable).

Another one of the paper bag's disadvantages is that they are a lot heavier than

plastic bags and therefore take more energy to transport. Paper is thicker than plastic and the material is heavier than the thin light plastic bag that can easily be carried by the wind.

"It would take approximately seven trucks to transport the same number of paper bags as can be transported by a single truck full of plastic bags" (Paper Or). This depends on how far they're traveling but for any distance, the shipping of paper bags uses a lot more trips or trucks which is pollutive and release greenhouse gasses. Shipping the paper bags has a negative impact on the environment because every trip contributes to global warming.

Paper and Plastic bags have both negative and positive effects on the environment. The disadvantages of paper bags include deforestation, but both require the resources needed to manufacture them, the second-hand effects on global warming, and the energy required to manufacture both. Some benefits include reusability and recyclability (which comes with its downsides), and the biodegradable option for plastic bags. Based on these facts, the best option is reusable (canvas) bags or using no bag at all for a small number of items. Will you choose a different bag or bring one of your own the next time you go to the store?

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# The Sharon Academy Middle School

**Known. Valued. Challenged.**

The Sharon Academy Middle School's character is defined by three fundamental attributes: a safe and supportive learning environment, rigorous academics achieved through our integrated curriculum and high expectations for all students; and a dedicated faculty that makes it all possible.

Through a variety of offerings and opportunities, TSA students graduate from our middle school confident of their own abilities, articulate in the communication of their knowledge and their needs, and effective as team members who are empowered to take responsibility and leadership within their communities.

**Safe** TSA strives to be a physically, socially, and emotionally safe environment for all students. Developing respect, compassion, and cooperation is an important focus of every school day.

**Integrated Curriculum** A central philosophical underpinning of the middle school curriculum is that information is best learned when it is connected and reinforced through relevant holistic themes. During the middle school's two-year curriculum cycle, students participate in an in-depth exploration of six units. Each unit is examined through the lenses of science, language arts and social studies. Students are encouraged to find and explore connections between the disciplines in each topic. This newsletter is the result of the Food and Hunger unit.

**Rigorous Academics** Our curriculum offers students many opportunities to learn how to work in teams, practice presentation and communication skills, and complete independent research. These skills form a strong foundation for future success - academic, social, and professional.

Individualized and/or leveled assignments are an example of one way we assist students to work to their potential. Most school assignments are available to all students at three different levels, each representing a different level of subject mastery. Students choose the assignment level that best challenges them - and are often encouraged by the teacher to reach to the next level.

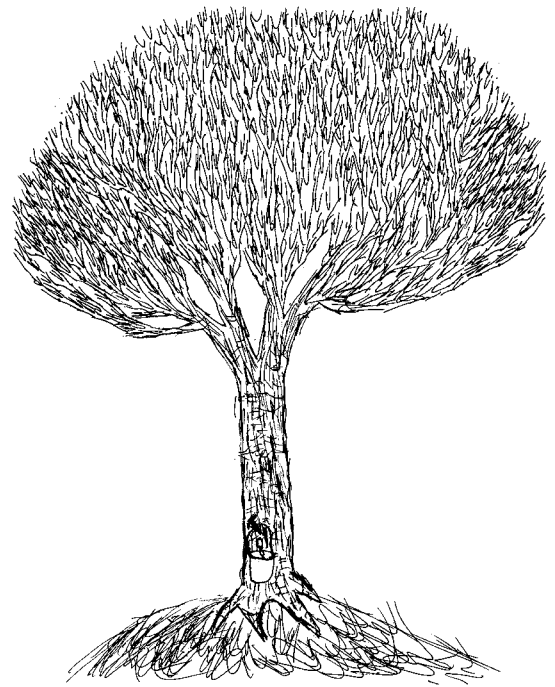
## Community

**Classes** Our classes are small: 9-15 students in each class.

**Strong Relationships** Supported by small class sizes, teachers are able to know each student as a whole person. Additionally, each student is assigned an advisor who is their advocate for academic, social, and emotional growth

**Mixed Groupings** Our program is structured so that the students interact as a whole community. Class groupings are reshuffled every six weeks and whole school projects are common.

**Community Service** To foster the value of hard work and service, all students are required to complete 20 hours of community service every year as a graduation requirement.



*After you are done reading this newsletter, please consider passing it along to something else who might enjoy it.*

## OUR TIMES

Food and Hunger in Our World  
Eighth Edition

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Special thanks to faculty members Pam Ward, Andrew Lane, Marcy Innes, Christian Durgin, Tom Diamond and Hannah Levinger for their support in helping students to hone their articles to the final stages.