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## Environmental Science in my life

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Environmental Science in my life (group 1)

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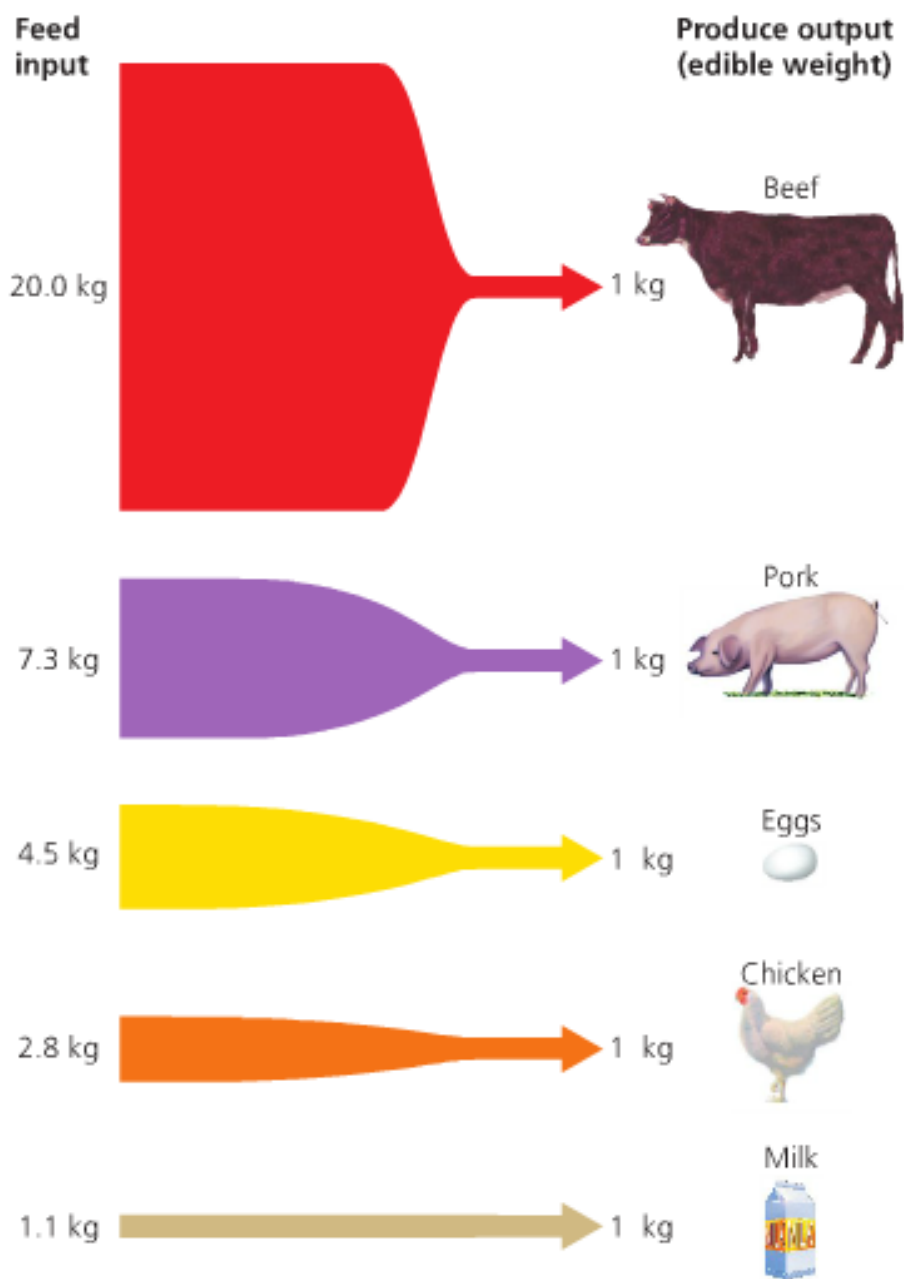
3 March 2017

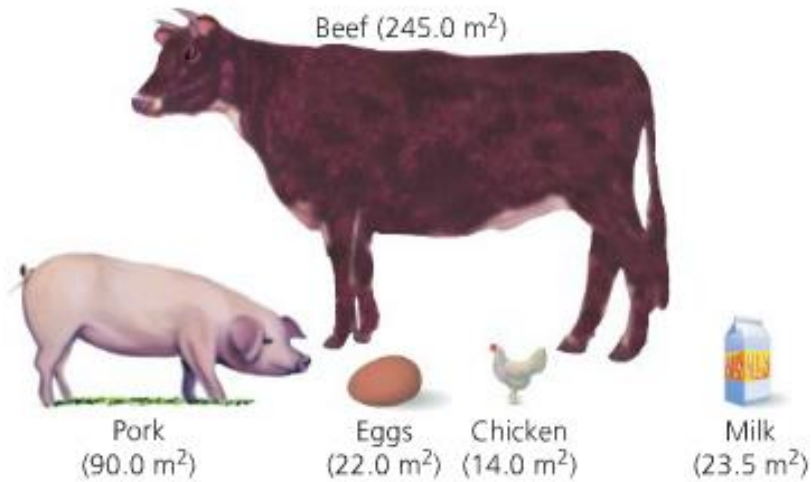
### The Environment relative to Nutrition

Nutrition plays an important role in bodily functions and interactions within the body, and in turn how humans interact with the world around them. Our nutrition affects many aspects of our lives, directly and indirectly. Some people eat a certain way or follow a certain diet in order to suppress symptoms and control breakouts relating to a chronic disease, or even to influence aspects of their behavior, like their energy level. When people choose to eat a certain way in hopes of changing their body, they often choose foods that are associated with human health, like lean meats and gluten-free options. When they make these decisions to eat healthier, they may assume that the environment benefits when our bodies appear to benefit. While this is true in some situations, this belief is just as false when it comes to the environment and nutrition. When we decide to eat healthier, or when we consume food in general, most people never even ponder how our food decisions affect our environment. Along with attempting to eat healthy, many people consume food with no thought beyond satisfying the hunger they are experiencing, missing an opportunity to choose an option that might benefit the environment. The average college student is especially prone to nutritional changes because they recently gained the responsibility of taking care of themselves. Their nutritional choices, however, rarely address their personal health and there is even less chance they consider taking care of the environment. Being aware of common emissions and unnecessary inputs involved in production processes,

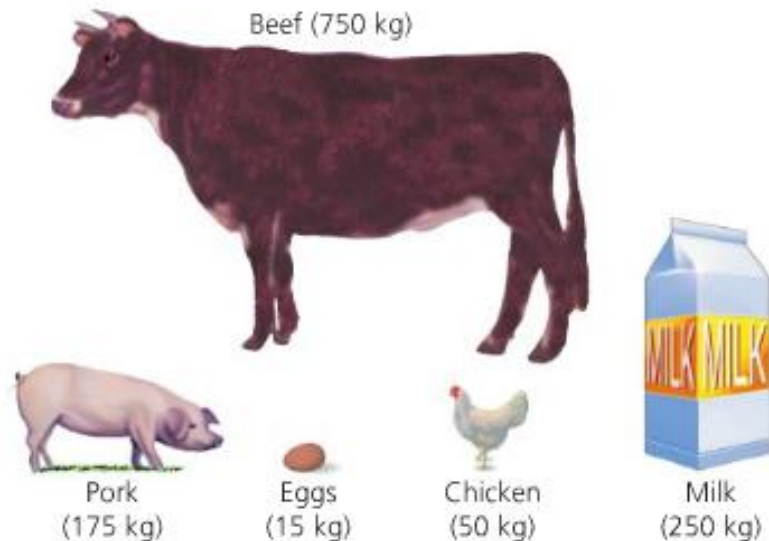
choosing to eat less animal products and more crops, and obtaining our foods from local sources, it is possible to lessen our diet-related impacts on the environment and reap nutritional benefits from better, more thoughtful food choices.

Many times when the decision of what to purchase is tackled, many people do not think about what resources are put into providing a product on a grocery store shelf, let alone what negative outputs are produced during these steps. While completely eliminating pollution and emissions is theoretically impossible, informed choices can shape the negative impacts associated with these factors by changing eating habits. During food production, many inputs are used to create the final product that is seen on the shelves of supermarkets. For animal products, these include animal feed, antibiotics, and facilities to house the animals, slaughterhouses, transportation services, and packaging products. We can make choices regarding what animal products we eat and “indirectly choos[e] how [we] make use of resources such as land and water,” evidently morphing our effects on the environment (Pearson 250). For example, “large amounts of animal feed need to be produced to make relatively small amounts of meat or milk,” meaning more food, energy, and land inputs are needed than positive outputs are produced (Sustainable Food). This can visually be seen in the diagrams below (Pearson 249).





**(a) Land required to produce 1 kg of protein**



**(b) Water required to produce 1 kg of protein**

Not only are negative inputs a concern, but also the outputs the production of animal products released into the environment. A popular argument against animal agriculture is the fact that “livestock...emit high levels of methane, a potent greenhouse gas” during their lifetime (Sustainable Food). On top of releasing greenhouse gases into the atmosphere, “animal feed is usually produced using nitrogen fertilizers,” which release nitrous oxide, another dangerous

greenhouse gas (Sustainable Food). For crops, inputs generally include: a plot to raise and harvest the plants, water resources, fertilizers and other disease-fighting products, equipment to harvest, transportation services, and packaging products. Relatively speaking, crops are a much more energy efficient and environmentally friendly option compared to animal products because the energy lost as one moves up the food pyramid (Pearson 249).

Both crops and animal products, however, must be transported from the location where they are produced to the places they are sold and consumed. This transportation may include refrigerating the product, preserving the items via chemical preservatives, and using vehicles like trucks or even airplanes, which require gasoline, to relocate the foods to supermarkets. The vice president of produce for Walmart, Dorn Wenninger, addressed the background of providing and selling “1.5 billion pounds” of bananas to Americans, touching base on the fact that those bananas had to be transported from Latin America and kept fresh, meaning that more resources were used during these processes (Business Insider). Many times when the decision of what to purchase is tackled, many people do not think about what resources are put into providing a product on a grocery store shelf, let alone what emissions are produced during these steps. Buying foods locally, from places like farmers markets or fruit stands, limits the distance these fruits and vegetables were required to be transported and therefore limits the inputs and emissions associated with this step.

Limiting animal products and introducing more plants into one’s diet can be done in varying degrees, and will have varying results and impacts concerning the body and environment. Many people today dedicate themselves to completely animal product-free diets, popularly known as veganism. These vegans choose to eliminate all animal byproducts out of their diets and sometimes even lifestyles because they do not agree with the use of, treatment of,

or benefits of utilizing animals in society today. Since these people do not participate in or financially support the animal agriculture industry, they do not contribute to the emissions produced while raising animals. Avoiding the negative impacts of animal husbandry, veganism has the least impact on the environment, making it the most environmentally-friendly diet there is.

Being environmentally-friendly in all aspects of life reaps benefits, however, there are extremes to every situation. Veganism could be labeled as an extreme choice of diets, just like how a diet containing only animal products would be an extreme as well. A good medium, and the most frequent lifestyle today, would be a diet containing both animal products and fruits and vegetables. While a person following this lifestyle would still require more energy input than a vegan person, if they are smart about their choices they can limit the negative effects of their diet on the environment without unrealistically or drastically changing their lifestyle.

As a college student, it is especially difficult to make drastic changes to my lifestyle, however, small, daily decisions to consume less animal products still makes a large positive difference within the environment. For a student who likely pays for their courses, textbooks, supplies, and other bills, following a diet on the extremes of a scale would place unnecessary stress, time, and financial responsibilities on the student. Following a diverse, well-rounded, crop-dominated diet with smaller amounts of animal products would be most beneficial. Small changes coming from an educated view of the nutrition needs and environmental costs can still benefit the environment when aspects like budgets, available time to prepare foods, and health concerns have been addressed. To achieve this medium, it is crucial that students become aware of how much meat and dairy they consume, how many food items they buy from supermarkets,



and their availability of food resources around them. Choices require understanding of the possibilities and consequences to be effective.

In order to shift one's diet to an environmentally-conscious lifestyle, a college student can do many things. First, becoming aware of which food groups the student relies on is crucial. Transitioning from a heavy animal-based diet to a diet focused on plants as the main source of energy will aid in limiting the emissions and pollution released into the atmosphere and limit the resource inputs needed to produce the foods. Secondly, determining where a student should and should not purchase their groceries is another factor in shifting one's lifestyle. Purchasing foods from supermarkets such as Walmart and Target promotes pollution because of the transportation utilized when relocating foods from their origin to those suppliers. Choosing to purchase fruits, veggies, and even meat from local growers and farmers via farmers markets and local farms avoids contributing to the unnecessary pollution associated with transportation. Because college students do not have unlimited money resources, however, choosing to go out of their way to purchase foods with less negative impacts can be difficult. This brings us to one last final step in changing one's lifestyle. Addressing one's budget, availability, and dedication concerning an environmentally-friendly diet introduces limitations to what a student can do. Because of this, it is important to make small, doable changes to one's nutritional decisions and to commit to what a student can realistically achieve, which is different for every college student. As a population that fully depends on our environment, it is important that we implement these changes into our diets. To start small, choosing to consume less meat, for example ordering one burger instead of two, is a seemingly easy decision that helps reduce meat consumption. Another option would be deciding to buy fresh fruits and vegetables from a local farmer's market once a weekly rather

than supporting Walmart's supply of these items. If every college student were to make these small changes today, we would have healthier bodies today and a better environment tomorrow.

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06 February 2017

## The Effects of Gluten on the Body

Gluten has been consumed by humans for thousands of years in the form of wheat, barley, and rye. Sadly, I cannot indulge in eating foods made with those grains as I am gluten intolerant. Gluten intolerance is how the immune system reacts to gluten, a protein found in wheat, barley, and rye, when it is digested in the body (Shaul). The immune system in a person who is allergic to gluten reacts differently to it than one who is not allergic and that will be covered in this paper. Gluten intolerance symptoms include: headaches, cramps, and rashes whenever gluten is consumed. The purpose of this research is to find out what the history of gluten intolerance is, the effects of gluten on the body, and what options and choices does someone who is gluten intolerant may have. By gathering various research sources from academic journals, various internet sources, and an environmental science class textbook to identify and understand the effects of gluten on the human body. Even though the research on this subject has a broad range of research material, this paper will focus merely on the illnesses that are caused by gluten and not go into the broad agricultural and chemical impact of foods containing gluten.

In much of the developed world and in particular, the United States, gluten products are in almost all processed foods. This mass use of gluten in has caused a lot of reactions to different people, in particular, coeliac disease. The websites that have published internet articles on the subject have some research data on gluten intolerance and Coeliac Disease and the relationship between the two. For some people, consuming food with gluten can cause lots of intestinal pain or pain in the joints (Gunnars). The intestinal pain is due to the immune system responding to the gluten proteins being detected in the body and then the immune system will then attack the gluten proteins, and unintentionally, the intestinal wall as well (Gunnars). This is the cause of Coeliac disease and some of the symptoms are a bloated stomach and intestinal pain. Aside from Coeliac disease there are other symptoms related to non-Coeliac disease gluten intolerance. The researchers on the internet have found that some of those symptoms related to gluten intolerance include: fatigue, hormonal imbalances, headaches, depressions, and the diagnosis of some autoimmune diseases (Myers). Therefore, according to these doctors and health experts, gluten causes or leads to these diseases or clinical effects. In most cases this conclusion was reached because patient's conditions improved once gluten was removed from the diet. None of these articles on the websites are peer reviewed or have substantial research behind them.

The environmental textbook has a lot of information on the process of growing wheat and the history of its cultivation. According to my textbook wheat and barley originated in the Middle East or "Fertile Crescent" about 10,500 years ago (Withgott). Therefore, the human race has been consuming grains containing gluten for quite some time, and one would suppose that the intolerance to those grains should have been detected a long time ago or they would have gradually removed gluten rich foods

from the standard diet. Actually, an ancient Greek physician by the name Aretaeus of Cappadocia was the first to diagnose and coin the term, "Coeliac disease". He wrote that, "not only does the disease cause failure of digestion, but there is failure to distribute even the partly digested product required for body growth" (Zoltan). Aretaeus is the earliest documentation of Coeliac disease, but he did not conclude that it was related to the consumption of gluten. There were many pediatricians who built off of Aretaeus' work, but it was not until 1924 when the American pediatrician, Sydney Haas, recommended isolating bread, crackers, and other baked goods from the patient's diet (Zoltan). However, she did not isolate all foodstuffs containing gluten. It was not until Dutch pediatrician William-Karel Dicke hypothesised during World War II that bread products were the cause of Coeliac disease. He came to this conclusion because he noticed that the health of children improved because of the bread shortages during the war (Zoltan). After this discovery doctors and specialists began studying all the ways gluten was impacting the body and some were even experimenting to see if the removal of gluten could improve the condition of other diseases.

Ever since William Dicke's discovery scientists have been doing more research on the impact of gluten consumption. For example, in 1966 scientists found that dermatitis herpetiformis had similarities to an abnormality of the small intestines, and this was confirmed in 1969 when they found that a gluten free diet helped improve the condition (Zoltan). There has even been research indicating that consuming gluten even has an impact on children suffering from Autism. The researchers found in a single blind, 2-year study that when the patients, who suffered from Autism, consumed a gluten free and dairy free diet they improved significantly and if the diet stopped they regressed (Shaul). The removal of foods with gluten from the diet found that, "Symptom improvements include speech, sociability, behavior and sleeping habits, as well as others." (Shaul). Scientists have found even more connections between disorders/diseases and gluten. One of those is Ron Hoggan, he has written many articles regarding the impact of gluten intolerance and he has found that depression may be caused by the consumption of gluten, and his research found that, "...morphine-like exorphins, derived from the incomplete breakdown of grains and dairy, alter mood by depressing Serotonin, Dopamine and Norpinephrine levels." (Shaul). Now, all of these scientists have data on how some of these diseases are related to eating products with gluten in them, and one might conclude that this problem of Coeliac disease and other gluten induced diseases are only in the developed world. That is not the case. A study found that the highest percentage rate of Coeliac disease is found among the Saharawi, who live in the Western Sahara region (Zoltan). Although, aside from that one country, the highest rates of Coeliac disease and other gluten induced diseases are found in the developed world, where highly processed foods and gluten rich foods are found. Along with the gluten prevalence the amount of processing and chemical preservatives in gluten products are cause for potential problems. Presswire found that the consumption of chemical food preservatives is so high in North America that the industry will be worth \$2.5 billion by 2020 (Presswire). They also found that the consumption of bread products are going to increase globally by 2022 (Presswire). With the high consumption of chemical preservatives and an increase in the consumption of gluten it will be interesting to see if gluten intolerance and Coeliac disease rates increase as a result of the high consumption.

All-together these researchers and scientists have found that gluten plays a large part in many diseases and disorders. Their findings confirm that the removal of gluten based products in the diet can actually improve a person's condition. To relate this to my gluten intolerance the data and research suggests

that I should cut gluten out of my diet completely. It will not only help me in the short term but also in the long term for my health.

However for a valid experiment, someone who is not gluten intolerant should test to see if they have any reactions from consuming gluten based products or any changes from a gluten free diet. If they have no reactions then there would be no benefit in changing their diet. Now, after doing all this research as someone who suffers from gluten intolerance I can say from personal experience and the research I have done that the research matches my experience. I therefore will discuss a personal experiment I have done on myself. Note, none of this data is peer-reviewed or has the control parameters that skilled researchers have. I have had many people try to discount the diagnosis by saying that it is "egg" or "milk" in the products that have caused my reactions. I have refuted these claims by attempting to eat the bare minimum of ingredients in gluten based products that have a low allergen reaction. I still reacted to the food products, and thus, I can conclude that it is the gluten that is causing my symptoms. I even tested baking my own gluten based foods with all natural ingredients with no preservatives, in case I am reacting to any of the chemical preservatives in the bread, but I still reacted negatively eating those foods. Also, whenever I ate gluten I would get a rash on my arms and legs, but when I cut gluten out of my diet for an extended period of time my rashes would go away. After my rashes had healed I tried to eat foods with gluten again and quickly the rashes returned. Based on these self-tests I have removed gluten from my diet completely. What I've learned is that gluten can cause a lot of different reactions in people and I have also learned that the research is still ongoing. Many of the scientific articles that I read are only a few years to a decade old so there is still time for the data to be challenged. As someone who suffers from it I will continue to cut gluten from my diet for my own health and mental well-being.

In the end, the consumption of gluten is something that is hard to escape considering how much of American culture uses the products. Therefore, as someone who is gluten intolerant I have to find foods that have no gluten content. This is hard sometimes as many food producers haven't developed a recipe for a gluten-free version of the food or the gluten-free version tastes absolutely terrible. As a result, being gluten free requires removing some cultural American foods completely from my diet. Examples include sweets and all fried foods. I will admit I sometimes cheat on my diet and eat highly processed foods that are rich in gluten, but of course I suffer the repercussions of that choice. My only choices sometimes is to not eat out or ask for special requests at restaurants. My one wish with being gluten-free is that one day a cure will be found or that genetic modifications could be done to the wheat, barley, and rye so that the gluten protein in them don't affect people who are gluten intolerant.

The symptoms of gluten intolerance are not something anyone would want, and the research that is being done to find out how much of it actually affects the human body will be of great interest to many people moving forward. It is hoped that adequate unbiased research is done to find a cure, cause, and ultimately a solution to the condition. However, all the research that has been done shows that gluten does have an effect on the body and the removal of it has shown improvement in some people, so until more research and testing is done people like myself have to keep gluten out of our diets to live a comfortable and happy life.

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### Time to Go Ecofriendly

In today's day and age, vehicles are our prone choice of transportation. It is a tool used to get from point A to point B. Whether it is going to work or going out to eat with friends, modern city urbanities drive everywhere they go. Based on the Bureau of Transportation Statistic, in the U.S alone every household has on average of at least 1.9 vehicles. Cars of course emit gas so while driving there is a release of carbon monoxide and nitrogen oxide into the environment, which in turn pollutes the air. Air pollution carries a series of health risks for the environment as well as for mankind as well. With the amount of day to day driving we do cars and trucks alone account for nearly one fifth of U.S carbon emissions. As we continue to release carbon dioxide, this in turn can cause climate changes, rising sea level, droughts, and ultimately leading to global warming.

We as a whole should take charge and make a difference, for the better of our environment as well as for the well-being of our society. To get things started there are alternatives such as using fuel efficient vehicles, cleaner fuels, and of course electric cars in which we could substitute for driving regular cars. This alone would not save our environment, it is only one of many factors; but by taking one step at a time, each problem at a time, we can help improve our health and the world we live in.

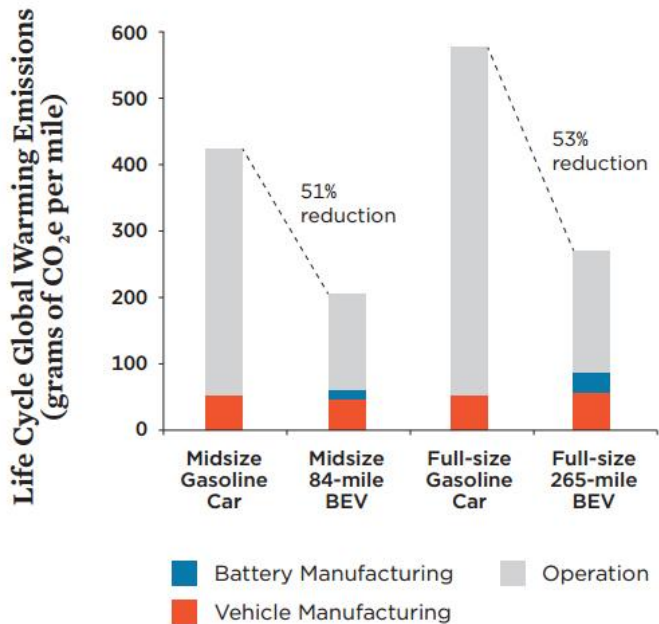
What is air pollution? Air pollution is the mixture of particles and gasses that gets dumped in the either from human activities or from natural causes. Humans have been responsible for most of the polluted we have today. Whether it is from a factory, a car, or even a simple camp human activities generate a lot of air pollutants. There are two types of air pollutant, primary and secondary.

Primary pollutants signifying a direct pollution whereas secondary pollution is formed from primary pollutants by chemical reactions in atmosphere which happen through interactions with the atmosphere. So example a primary pollutant would

the emission of carbon monoxide from cars, while the production of ozone would be an example of secondary pollution. As stated in the introduction productions from cars and trucks account for nearly one fifth or carbon emissions, which is a substantial amount. With the earth's population being projected to reach a staggering 9 billion within the next 30 years, due to the population growth air pollution is inevitably going to increase. Considering air pollution from vehicles alone, as our population grows the need for cars and other mode of transportation rises as well. This influx of cars would consequently increase the amount of carbon monoxide that gets released into the air, further polluting our air.

## Global emission of Vehicles

Life Cycle Global Warming Emissions from the Manufacturing and Operation of Gasoline and Battery-Electric Vehicles



Note: We assume that the midsize vehicles are driven 135,000 miles over their lifetimes and the full-size vehicles 179,000 miles. The difference in the two mileages derives from the dissimilar uses of 84-mile-range and 265-mile-range battery-electric cars, as described in Chapter 2. We further assume that a consumer buying a BEV would drive it the same total of miles as a corresponding gasoline vehicle. We use U.S. average electricity grid emissions to estimate manufacturing emissions, while the average electricity grid emissions intensity during vehicle operation are based on a sales-weighted average of where EVs are being sold today.

Learn more at: [ucsusa.org/EVlifecycle](https://ucsusa.org/EVlifecycle)

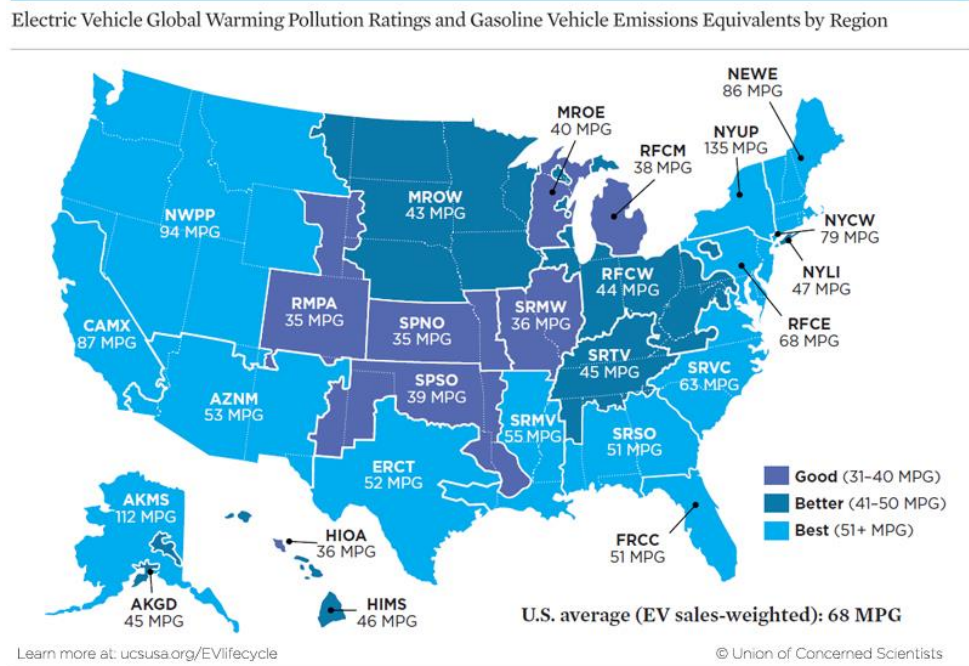
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Within the past decades efforts to reduce pollution such as passing the CAA, or the Clean Air Act. Established in 1970 and amended in 1977, The Clean Air Act’s primary goal was to control air pollution on a national level by regulating air emissions from stationary and moving sources. This played a huge impact, since the 1980s ground level ozone has been reduced by more than 25 percent. This act also promoted cleaner fuels which resulted in the reduction in the amount of lead in gasoline; in turn resulting in a 92 percent reduction in lead pollution. With strides like this society as a whole could dramatically decrease the amount of pollution being emitted by human beings, starting with lowering carbon monoxide. Transitioning from gasoline powered automotive to electric cars is one possible improvement and a second is making cars more gas efficient in general.

Based on the Union of Concerned Scientists, electric cars produced today emit “less than half the global warming

emissions” when compared to gasoline powered vehicles producing 50 miles to the gallon. Tesla for instance, the model X marketed as the most fuel efficient SUV ever to be produced with extraordinary margins.



With a combined mileage of both highway and city, this car is able to venture at a rate of 92 miles per gallon. When compared to an average SUV the difference is astonishing. When compared to the model X, the model X is easily able to surpass the modern day SUV by being three times more efficient.

For instance, after high school I will be attending Texas State. Being in San Marcos, a 252-mile drive, I not only will need a reliable mode of transportation but also one that is gas efficient. With college tuition already starting at \$10,000 a semester, finding any way to save money will be crucial in the long run. On average the average American will spend a staggering \$2,000 a year filling up their car's gas tanks. Based on recent estimates, from Fox Business Reports, our national gas average is around \$3.74 a gallon (Fox Business Support). If I want to cut spending cost finding a car that has a higher mile per gallon rate would tremendously reduce my yearly spending cost on gas. For example, let us compare two cars the Honda Accord and the Toyota Prius. The Honda Accord in this case would represent the average American car whereas the Toyota Prius would represent the ecofriendly alternative. From the lot the 2017 Honda Accord has a highway mpg rate of 36, while the 2017 Toyota Prius has an mpg rate of 53. To put it in perspective a drive from Allen Texas, to San Marcos, and then back to Allen would be a total of 504 miles. If I were to take the Accord, with its mpg rate of 36, I would have to fill up the car a total of 14 times; whereas on the Prius it would only take 9. Not only that it is more expensive but the CO emission of an Accord would also be substantially higher when compared to the Prius. When looking at a car the higher the mpg the less energy is required, meaning less gas is required, which ultimately corresponds to lower CO, NOx, and VOC emissions. When evaluating both cars, due to its high mpg rate not only will the Prius save money but it would also cut down pollution making this the most efficient choice.

If it was a perfect utopia everyone would have electric cars and gas powered vehicles would be a thing of the past. Unfortunately, this is not yet realistic. There are factors such as money, opinion, and time that needs to be accounted for. Everyone in this society has different financial capabilities as well as opinions, thus pushing us to find a solution that removes all possible determinates. Starting with education, by providing awareness among the population of the environmental impact our choices have, this could incline many people to make decisions that could be better for and improve the environment. For example, educating children on the benefits of recycling and how our society can save resources and reduce air and water pollution. Has resulted in those children now recycling their plastic bottles instead of

placing bottles in the trash. The same goes for buying a car. If our society conditioned people to consider on the benefits of ecofriendly cars instead of buying the coolest fastest car out there, then when the time comes to purchase a vehicle it would reflect that.

With the world growing, more people having to be inclined to drive. As a result, driving has become a huge factor causing global warming and city smog. Not only does that effect the environment, destroying habitats and wild life, but it is directly effecting human health as well. If no change is made it will only be time before we will truly suffer from polluted air and destroyed resources.

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Environmental Science 1402.S01

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### Alternative Methods to Termite Prevention

Environmental Science has been an awakening to my senses of all the living and non- living things in existence around me, so much so that I recently encountered an epidemic of termites as tenants within my home. According to *Extermatrim*, "Eastern Subterranean Termites, which are native to Louisiana, can eat 1 foot of 2x4 in 120 days, while Formosan termites can eat that same amount of wood in only 19 days." The exterminator informed us that we had one of these types of termites living within our walls. Due to these findings, my family's home was in danger of catastrophic damage. They are beneficial to the environment in various ways, which is why I urge individuals to look into alternative methods to safeguarding against them. Marci Goodwin, author of *Termites' Purpose in Nature*, states their mounds regulate water absorption into soil, thereby enhancing the growth of plants while increasing the fertility of soil. However in my experience, they served as a complete nuisance and financial burden to my family and me. Termites have very healthy appetites it seems and can eat through a home in a small amount of time. Undetected it takes a colony over two full years to form completely, which can create monumental damage to a building's structure and foundation while their habitat forms.



My landlord had an exterminator come out to do a 5 point inspection of the damage done by the termite colony within our home. The results were beyond any simple means of resolution or repair. The roof rafters were eaten to pieces, making my home's structure unstable.



The exterminator advised our landlord that they would have to treat the home with strong pesticides to kill the existing colonies, which had expanded over time. These pesticides are otherwise known as sulfuryl fluoride (Vikane) a highly toxic nerve gas. My family and I were then notified that we had to remove ourselves from the premises, including all pets, for two full days. The exterminators scheduled a time-slot on the calendar for our house to be fumigated, also known as termite tenting. My family was instructed to double bag our food items in order to avoid poisoning during their extermination. Anything that was not covered was considered trash. The cost of this process ranged from \$1,000- 2,500 dollars for the landlord, while costing my family \$750 for a motel stay and dog kennel services. As a matter of fact, William Quarles, author of *Baits and Barriers*, states termite damages cost the US over 2 billion dollars a year. We had to adjust our entire lives around the solution to a preventable crisis, which baffled my family, not to mention being at risk of exposure to these highly poisonous toxins.

The termite tenting procedure was a precisely calculated maneuver, which consisted of taking highly precautionous measures. It requires an entire house to be covered with a tent shell. It is then clamped with commercial grade tight grips to keep all the termite poisons from escaping into the atmosphere. It literally looks like a circus sideshow tent when they are performing this task, as shown below.



Immediately following the termite fumigation, safety checks were performed to ensure safe air quality in and around my family's home. According to *Termites.com*:

After fumigation, the tent over the treatment area is removed, and the fumigant gases diffuse into the air, rapidly leaving your home. Following six hours of ventilation, your pest management professional will use devices that detect trace amounts of sulfurly fluoride and chloropicrin in the air. According to the United States Environmental Protection Agency (EPA), re-entry is not permitted until sulfurly fluoride levels are 1 part per million or less. (During the fumigation, concentrations may reach 3,850 parts per million or higher.) These are among the most toxic and hazardous pesticides used today.

Due to these unfortunate circumstances, there have been reports of human fatalities caused by these lingering fumes. The author of *Termites, Air Pollution, and Ozone Depletion* claims studies have shown that many household goods can hold parts of these poisons for up to forty days while releasing them into the atmosphere. These lingering fumes can drift into neighboring homes and pollute their air quality causing harm or even death as I already mentioned. There is no doubt that prior preventable tactics are necessary.

There are alternative options in the prevention of termites such as using pretreated wood when building homes, and using bait blocks. Pretreated woods consists of manmade organic chemicals called borates, which are harmful to termites. William Quarles claims "It is much cheaper to keep termites out of a building than to get rid of them and repair the damage once they are inside." From my experience with termites, I could not agree more. Equally important is the fact that environmentalists tend to lean toward baits and barriers for prevention of termites, due to the low impact on the environment (4). Chemical barriers have been proven to be successful in the efforts to prevent termites. The design consists of digging trenches around building perimeters and adding several gallons of liquid pesticides; they may also be pumped into the soil underneath concrete slabs. Termidor is a deep-rooted pesticide, with minimal environmental effect. When applied only a low application rate of the active ingredient (0.06% and 0.125%) is used. The EPA has approved each termiticide and has a registered label that specifies application rates (4). Termidor is odorless and is safe around humans and pets, when using it you do not even have to leave your home.

Termites is a prime example of disturbance upon habitats within other species, creating a ripple effect upon survival of the fittest and the well-being of the environment. Careful consideration and analysis of the future should be of utmost importance in today's era regarding habitats. The evidence speaks for itself when pertaining to termite prevention methods. Protecting homes are essentially the homeowner's responsibility and should be done at all costs when it affects human life and the environment. I have learned from my experience to take the softer approach to termite prevention, with bait blocks. I feel it is my sole obligation to Mother Nature to abstain from polluting with strong pesticides such as Vikane. Premeditated precautions ensures limited harm in the future to the environment and the health of humans.

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### Operation: Garage Clean Up

After living in a house for the past 12 years, the house given time becomes a comfortable living space, without boxes and clutter disrupting the nice free flowing of ambience throughout the household. Over the years we collect old shoes, clothes, cardboard boxes, a rainbow of miscellaneous fluids, and other precious goods we decide not to part with for sentimental reasons. Where do all of these things go? Certainly not in the nice junk free zone inside the cozy house. That only leaves one place where no one will ever see it, a place of vast capacity for hiding junk. The garage! In the 12 years it takes of stuffing old shoes, clothes, cardboard boxes, a rainbow of miscellaneous fluids, and other precious goods into every nook and cranny of that overstocked room called a garage, well, that is when it's time to clear out your old dusty garage. Have no fear this is the norm, survey says from an article in an issue of the Smithsonian that, "73 percent of all Americans enter their houses via the garage -- each of them staring straight ahead to avoid seeing the stuff piled up where the cars are supposed to go"(Conniff).

When cleaning a garage it is often found from sorting and separating various types of items, ranging from broken mementos to dried-out leftover soil to empty cardboard boxes and styrofoam, that disposing of these items becomes a dilemma. While sorting is a productive start it is quickly realized that rearranging the treasured junk does not solve the problem. Not unless there is somewhere to put it, that is, someplace that it isn't wasting space and easy to access to store the said junk, while also taking little to no time to get rid of and with little to no quantity

restrictions, while at the same time being eco-friendly. The question is, what are clean and effective methods of quickly disposing clutter to remove it without much effect on the environment? First we must consider the effects of disposing the clutter without thought straight into a landfill in a garage and then compare with new or unrecognized but efficient ways to dispose of clutter and unwanted materials, preferably using completely free public services. Then this paper will research the effects of removing the clutter by these methods. The extent of the research in this essay will be focused on mainly removing old clothes, cardboard, and municipal solid waste. Toxic and hazardous waste is also accumulated in the form of chemical waste but as the safe disposal varies product by product this issue was deemed outside of the scope of this paper

Online research identifies many ways to remove unwanted items causing clutter. Many places like the Salvation Army, will pick up old clothing, appliances, and furniture for free. Alternatively, there are recycle facilities that people bring recyclable goods which do not limit the number of visits, such as Republic Services. Some places such as the City Dump require a limit on the number of trips per household. The effectiveness of those trips will vary based on the size of vehicle the household has available. These recycling facilities also have certain areas for disposal of hazardous fluids which is necessary knowledge for disposal of any excess pesticides or washer fluids, which is a serious waste disposal issue among the junk in most garages but not covered further in this paper.

Considering a specific facility as an example the Republic Services Facility in Plano on 14th street, has a dumpster/pile for recycled goods- such as paper, plastic, aluminum cans, and cardboard- then beside it was a another disposal container for “special handling “waste- such as, paint containers, toxic material containers, broken light bulbs, and other items as such. An

alternative option to this would be to contact The Republic Services - of course this would be with a “flat rate fee for two years”- and ask for “Curbside Waste Removal” assistance-which includes services such as “All-In-One Recycling, solid waste, dumpster rental, bulk waste, yard waste, household hazardous waste, organic waste, and sharp needles disposal”.

For the most part it is common knowledge that sending old boxes and aluminum cans can be a cinch with the convenient recycle services from local facilities such as Republic Services. At recycle facilities recovered items are sorted and reprocessed to be reused yet again. This saves resources and the effort it would take starting from scratch. Getting rid of bags of old clothes and toys can be taken to multiple places that accept these thrifty goods which are either sold or donated to charity. However the same beneficial methods cannot be used for municipal solid waste- which are the smelly piles of trash that will collect bacteria and reek a putrid odor causing potentially harmful side effects around anyone chronically exposed to it.

Nonrenewable trash is, disposed of into a trash bin by the average person, it is then picked up on trash day- which in Plano is every Tuesday-by sanitation engineers and taken to a nearby “sanitary landfill, [where] waste is buried in the ground or piled up in large mounds engineered to prevent waste from contaminating the environment and threatening public health” (Withgott & Laposata 613). Thankfully the amount of waste going to these landfills have decreased, just in 2010 it was found that “54% of waste went to landfills , 12% to incinerators, whereas 34% was recovered for composting and recycling”(Withgott & Laposata 613). Dumping trash into a landfill remains a major issue it means bringing a load of trash into a space and piling it up until nothing more would fit into that location. Once a landfill site eventually decides to close to find a new location elsewhere, “it is [fully] capped with an engineered cover... this cap consists of a hydraulic barrier of plastic, which prevents water from seeping down and gas from

seeping up”(Withgott & Laposata 614). For a while the idea of running out of space didn’t seem like a major problem until it did become obvious in places like Staten Island, New York-where they had to have their waste transported for significant distances to place the waste in locations where the putrid odor, “health threat”, and “civic blemish” the landfill brought along with it did not impact people’s lives. Of course if the amount of waste was smaller and processed correctly the waste would decompose over time leaving behind a smaller ecological impact.

There are also other ways to dispose of municipal solid wastes if the landfills do not suffice. For example there are energy companies such as Montenay Energy Resources in Conshohocken, Pennsylvania where “waste is converted to thermal energy, which is used to produce electricity for 30,000 homes” (Heney 1). This can be beneficial if we are trying to distribute the effects the waste has on the environment somewhat evenly, while at the same time getting something of great value in return: energy. Given the day and age technology has become a big part of the world and with it we need energy to stay in contact with this cyber world we’ve built. Why not make the junk in the garage “another man’s treasure” (Heney 1)? Or in this case many people’s treasure. However, incomplete combustion of waste has the potential of releasing hazardous chemicals into the air and the ash waste from these processes is concentrated noncombustible material which is highly toxic.

The people in “Moratuwa, a suburban municipality of Sri Lanka” were chosen to conduct a study of research of the “average composition of household waste generation municipality of Moratuwa” (Bandara 3). The average percentage of the composition of waste per household in the suburban area with “families from [a] diverse social and economic background” was 90% organic, 5% paper, 3% plastic, 2% glass, 1% metal. Given the similarity background of the suburban area of Moratuwa to that of the suburban areas in the USA it is presumable that the

data may be applicable to the USA as well. About two-thirds of the items in the garage are endless arrays of paper, plastic, metal, and a small percentage of it is organic. These calculations allow room for something to think about in the future given that the overcrowded garage is made up mostly paper, plastic, and metal which altogether is roughly around 11% of the total average composition of waste per household given the statistical data from Moratuwa experiment. Perhaps in the future steps could be taken to decrease the casualties of organic waste.

As a conclusion, despite not being able to complete the ultimate goal- cleaning up the garage- this new information from the research enlightens us of the ways of our everyday lifestyle habits involving both recyclable and municipal waste and how it affects the environment. Getting rid of the boxes taking up space or the clothes and old shoes that dominate your garage can be super easy given the easy convenience of public recycle facilities and donation drives. Municipal solid wastes can be a bit of an issue if not handled correctly in smaller thinned out quantities-thanks to recycling and incineration. Incineration does have its own issues but given that it's being used as 12% of disposal methods and benefits by providing us energy the footprint stays small. However it is beneficial to know, that recycling is a simple way to effectively decrease our ecological footprint on earth, so that more sustainable lifestyles now leave the earth in a better state for the next generation who occupy it. So hopefully the next time someone decides to throw junk into the garage or toss it in a dumpster they will think twice about where it goes and how it could be better used/reused or recycled.

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