Mark Steffen
Gilbert High School
Gilbert, IA
Brazil, Factor 8: Spoilage & Waste

Brazil: Advancing Technology to Save Food

The South American country of Brazil is in the world records right now as the fifth largest country by both land size and population. Its immense size and large population allow for much diversity within the county's borders. Brazil has many claims to fame, from the deep, moist shadows of the Amazon Rainforest in the north to the outstretched arms of Christ the Redeemer on southeast coast. Brazil is also a cultural melting pot with strong ties to Portugal, Spain, Africa, and the indigenous. Carnaval celebrations in Brazil are raucous parties lasting for days on end, drawing many visitors from around the world. Brazil also won the bid to host the 2014 FIFA World Cup and the 2016 Summer Olympics.

Brazil is a Federal Presidential Republic. It encompasses a total of 8,515,770 square kilometers, with a dry land accounting for 8,358,140 square kilometers of that (The World Factbook: BRAZIL). About a fourth, 2,825,890 sq. km, is cultivated for agricultural use. (Agricultural Land (Sq. Km)) Whereas the average farm in the U.S. is under 500 acres, with half of those under 99 acres, the average farm size in Brazil is over 500 acres (Stratfor). This country is known for its plantation style farming. Brazil is one of the world's leading exporters of beef and soybeans. Brazil also cultivates coffee, wheat, rice, corn, sugarcane, cocoa, and citrus (The World Factbook: BRAZIL). The climate in Brazil varies greatly from the northern border to the southern border because of the countries immense size. It is humid, wet in the rainforests of the north, hot, and sticky along the coast. The central highlands are hot and arid, and the equator runs through the very northern portion of Brazil. The majority of Brazil's population is located in the southeast of the country (Brazil). The total population of Brazil is 207,353,391. 86.2% are urban dwellers and the other 13.8% are rural (The World Factbook: BRAZIL).

The average Brazilian family size has slowly fallen over the past decade, and the average Brazilian family would consist of two parents and two children (The World Factbook: BRAZIL). It is also common for up to three generation to be found living under the same roof, especially in the rural setting. The average gross domestic product (GDP) value per capita is 15,500 United States dollars (USD). This puts Brazil 107th in the world by GDP per capita (The World Factbook: BRAZIL). The average household income is only 46,627 USD, but because the country's GDP is so low, access to goods and services is not limited by money (Point2 Homes). 10% of the 116 million-person workforce works in agriculture, 40% industry, and 50% services. 92.6% of the population over the age of 15 is literate, and most children attend school until they are at least 15. Brazil has an average of 1.85 physicians per 1,000 people, which is slightly lower than the average here, in the United States (The World Factbook: BRAZIL). Brazilian families simply go to the nearest grocery store or supermarket to obtain food. Brazilian diets often consist of fresh tropic fruits, beans and rice, and red meat or seafood. They then come back to their homes, 100% of which have running water in urban areas, and prepare their food much the same as we would here in the U.S. These numbers are slightly lower in rural areas, but the majority of the population lives in urban areas, so the

average family in Brazil is urban. Because over 50% of the population is now middle class and only 4% is below the poverty line, Brazil's average family is middle class.

Here in America, we waste 40% of our food. This is an average of 20 pounds a month per person and the total for America runs up to a staggering 160 billion pounds of food waste every year. The wasted food could feed the entire population of Texas, 25 million people. Along with the loss of food products and unnecessary addition to landfills, this waste of food costs each American household over $2,200. The total monetary loss for Americans: $165 billion (Food Matters). America's waste problem is born from attitudes within our households, but the same is not true for Brazil. Whereas in the United States the majority of food waste occurs during consumption, Brazil creates over 50% of its waste from production to processing. The majority of this waste occurs before the products even have a chance to hit the processing stage. The monetary value of Brazil's waste is not as high as America's, but this is mainly because Brazil's total waste is only about 15% of its food supply. (Samsung Engineering)

In Brazil, food waste and spoilage is an economic issue. Brazil is a developed country, but they do not have a strong enough infrastructure for the demands placed on it. Even though Brazil ranked fourth in the world for total length of roads, they are not up to the challenge (The World Factbook: BRAZIL). Brazil only ranks 107th out of 144 countries evaluated by level of infrastructure development (Brazil - Transportation). Shipping by semi-truck trailer is the most common form of transport in Brazil, and 22% of the countries waste occurs during transport (Samsung Engineering). Roads are in dire need of repair and expansion, but the Brazilian government lacks the funds for these public works projects. An economic recession hit Brazil in 2014, and the country has only just now begun a slow recovery. Brazil, so far, has failed to tap into the potential of railroads and use of waterways for shipping. They simply lack the volume of railroads needed to make transporting produce feasible through that medium. The ports are also in need of updating and expansion (Brazil - Transportation). The food processing industry also faces some obstacles. There are over 45,000 registered food industry companies in Brazil. Approximately 86% of these companies are extremely small, boasting only 20 employees or less (Gouvea). This family-owned fragmentation in the industry can lead to loss of quality control. It is difficult for the government to police every single operation, and pay-offs for officials to turn a blind eye are not unheard of. Another facet to this waste problem is a lack of large supermarket chains. The largest supermarket retailer in Brazil, Pao de Açúcar, owns 2,181 stores. The next largest presence, Walmart, only has 485 stores (Gouvea). By comparison, the United States has over 4,000 Walmart stores alone. The lack of volume of large retail stores means lowered demand of products at the retail end of the chain. This then allows farmers to take less care when harvesting and transporting their produce because they can fulfill demand with such high waste. In addition, spoilage in raw milk products is caused by bacterium. This tends to stem from a lack of proper care, handling, and cold storage.

Awareness of these problems has started to change in Brazil. Research has been conducted and continues on the bacterial spoilage of raw milk products. However, improvements to the infrastructure are too few and too slow to make a difference. The economic recession of 2014, and the massive scale of the projects themselves mainly cause this. Food spoilage and waste also affects both the producers and the consumers.

28% of food waste occurs during production (Samsung Engineering). By eliminating this waste, farmers' profitability would sky rocket. They would be producing over a quarter more food on the same amount of land, and this in turn would lower prices on the consumer end and increase exports. This increased yield would decrease the need to use slash and burn clearing on pristine rainforest land. Increased agricultural production would help propel Brazil's economy to its pre-recession strength. This would also increase the overall GDP of the country, benefitting all citizens. Increasing care during transport and processing will reduce the risk of consumers, especially the young and elderly, from receiving food borne illnesses.

The first problem Brazil's government should address is that of infrastructure. Interconnectedness is vital to a country's success, and infrastructure is the backbone of interconnectedness. The fact Brazil ranked 107th in a study of infrastructure development is deplorable. They are the fifth largest country by both geographical area and population, so it would make sense they would have a much more developed infrastructure. The benefits to improving infrastructure are immense. The first major benefit is an increase in ease of travel and transport within Brazil. Improving road quality will decrease the time it takes to transport products, reducing the risk of spoilage during transport. This also benefits everyday citizens by making different parts of the country more accessible. The major setback of such a project is the cost of addressing such a colossal issue. Brazil's government is currently trying to make improvements using a system of concessions. Concessions are when the government sells off rights to government owned property, such as airports, for a set amount to companies in the private sector as a source of funding. So far, the concessions have not brought in nearly enough revenue to undertake an updating of infrastructure (Brazil - Transportation). This means the Brazilian government needs to explore different routes for funding this project. One way to fund road building and repair is to open toll routes. The revenue gained from these toll routes would be used to fund future building and maintenance of roadways. Another way to help infrastructure to grow would be to allow large, international transport companies to come and operate within the country. Brazil has very few railroads, so allowing companies to come in and develop railroads will create competition and expand this part of infrastructure. In addition, encouraging large semi-truck freight companies to operate in Brazil would streamline shipping logistics on the currently limited roads.

Another problem to address is the amount of spoilage during transport and storage before processing. 22% of spoilage occurs during this time (Samsung Engineering). This problem can be solved within the private sector through improvements in shipping and storage technology. The benefits of making these changes are, reducing the amount of waste, and this protects from the passage of food borne illness. When transporting raw produce, it is vital to keep these products within certain environmental parameters. Most produce, other than grains, require a climate controlled environment. By expanding the use of refrigerated truck trailers, the spoilage of raw produce during transportation would be greatly reduced. Warehouses also need to guarantee a climate controlled environment for raw produce. The government should encourage this trend by offering tax breaks or cash compensation to companies making this change or already using this technology. Along with this, processors must ensure they are using proper techniques for preserving food, such as treating produce with acids to kill bacteria. While all of this will increase the cost of shipping and processing, the produce saved will more than offset these costs.

Increasing the number of large scale food processors, and inversely reducing the number of small operations, will help to prevent both spoilage and waste during the transport and storage and processing of produce. Because Brazil's food industry is so fragmented, produce sits in storage and is lost before it can be processed. Not only will this help ensure all produce is being processed, large-scale companies make government regulation easier. Large factories also tend to follow stricter cleanliness policies, streamline processing, and provide controlled storage for perishable products. On the other side, this will shut down a number of the smaller, privately owned processors and reduce competition within the market, but these are a necessity to reduce the waste occurring before processing. An avenue the small processors can explore is merging several companies together into one large company. The large processors will guarantee a steady demand on raw products for processing, increasing the turnover rate of produce storage facilities. This will decrease spoilage at the point of storage, and the increased processing will mean fresher produce is being prepared for consumption. Large companies also expand more often and on a larger scale than those of their small, private counterparts. Expansion of industry will aid to the recovery of the Brazilian economy, improving life for all Brazilians.

Brazil has the potential to boost themselves to the top tier of the world market by focusing on improvements to technology and infrastructure. The richly diverse population of this country must band together with one goal: elimination of food waste. By working with the government, the private sector can help take the reins to drive Brazil out of its recession and into a new golden era of both agriculture and technological proficiency. By implementing new technologies to preserve food, the productivity of this South American country could go up as much as 8-10%. The Brazilian government cannot sit idly by for this to happen. They must encourage the use of these technologies and modernize the infrastructure of their country to ensure the economic success and food safety of generations to come.

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