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France, Spoilage and Waste

France: The European Union's Agricultural Powerhouse Facing Spoilage and Waste Issues

France is globally known for its gourmet food and expensive wines. The ethnically diverse nation in Europe is home to 65.6 million people (United Nations, Department of Economic and Social Affairs, 2023), however 9 million of the country's 65 million are living in poverty (United Nations, Department of Economic and Social Affairs, 2023). Food insecurity affects people from various walks of life in France, whether it is related to age or gender discrepancies or socioeconomic status. In France, millions of residents struggle to provide adequate nourishment for themselves and their families. The food that is desperately needed is there but is not accessible to those who need it. Millions of pounds of food fall victim to spoilage and waste daily. Supermarkets, local government officials, and French farmers need to adopt new practices and redesign their distribution methods and food spoilage protocols in order to serve those in need and reduce the waste of this massive amount of food. Compounding the waste and spoilage issue in France is poor agricultural and production methods. Locally grown agricultural hectares are not available to those who need it. It is necessary for local leaders to successfully assist marginalized communities by allowing this land to be more available to the general population of France.

France comprises thirteen regions, departments, and 36,000 towns and villages. Its poorest region is Corsica, with just under 20 percent of people living there surviving on less than the median income (The Local, 2019). France is governed by a semi-presidential republic, with a head of government, which is the prime minister, who is appointed by the president (Directorate-General for Communication, 2023). France is one of the twenty seven countries in the European Union, which is an economic and political union created to maintain common policies on trade, agriculture, and development. Not only is France ethnically mixed, but the geography within the nation is also very diverse. France is a majority urban nation. Being that it is about 81 percent urban, the citizens live mainly in cities and towns (Jeudy, 2022). With that being said, France has a temperate climate and varied topography, consisting of relatively low-lying plains and plateaus, while the remainder of the country is mountainous with the Pyrenees in the south and the Alps in the east (Blondel et al., 2023). Despite the alterations in altitudes throughout the nation, about 45 percent of the country is cultivated (Trenda, 2021). Being that France doesn't entirely rely on their farms to produce food to their citizens, their farms are not as big in comparison to the United States. However, statistics show that the average size of a farm in France is 69 hectares (equivalent to about 270 acres). This number has also increased by 14 hectares in the span of 10 years, which can be associated with the reliance the European Union (EU) has on France's crop production (de La Hamaide & Clarke, 2021).

In 2020, the top countries which France traded and exported their food products included the United States, United Kingdom, Germany, Belgium and Spain (Economics, 2022). The main crops that France produces are sugar beet, wheat, maize, barley and potatoes (PGRFA HUB, 2023). Even though France mainly exports transport equipment (23 percent of total exports), agro-food industry products make up 10 percent of the country's total exports (Economics, 2022). Being that France is the largest agricultural country in the EU, there has been a push to adopt more sustainable agricultural practices. Among the crops listed above, grains are also a very significant export to the EU. More than half of the country's arable land is used for cereals, which overall contribute to about one-sixth of the total value of agricultural output (Tuppen, 2023). Shockingly, agriculture only employs about 3 percent of the labor force, even though France deals with a 7.3 percent unemployment rate as of 2022 (Jeudy, 2022). Being that food insecurity impacts low income families the most in France, the employment opportunities pertaining to

agriculture should be higher, and more efforts should be made to focus on ways to become more sustainable, especially with the role France plays in providing for countries in the EU.

Lunch is a very important meal for the French, with many shops closed during the middle of the day to enjoy a universal lunch break. France is a generally wealthy country with western living conditions, which support the average family size of about 2.18 people (Plc, 2022). Their government provides free education up until the age of sixteen to all of their citizens, as well as supplying 99.25 percent of their total population with access to clean water, and 100 percent with access to electricity, mainly supported by nuclear power (U.S. Energy Information Administration, 2016). Furthermore, the people of France have access to universal health care regardless of age or economic status (Ministry of Social Affairs and Health, 2022). With that being said, there are still millions of people in France that struggle to support themselves financially, and the slow-growing economy is said to contribute to this issue. Around 3 million people are regularly deprived of basic hygiene products. Even charities made to support vulnerable people who face financial difficulties deal with shortages in these products which are necessities to people living in poverty (Ellen MacArthur Foundation, 2021). Low income families are affected by food insecurity the most in France, and often deal with the result of poor spillage and waste methods used by wealthier groups.

France is producing about 35 percent waste, in comparison to the less than 30 percent European average (Mandard, 2022). On top of that, France is also doing a worse job than the European Union's average. In 2016, France passed legislation that prohibited supermarkets from throwing away food. Instead, the unsold goods now have to be reused, donated, or recycled. This law saves 46,000 tons a year that would otherwise be thrown away (Ellen MacArthur Foundation, 2021). Not only is this a step in the right direction to combat food waste, but the grocery stores who partake in this new legislation also receive a tax break of 60 percent on the inventory value of the donated food (Saltzman et al., 2019). The transition to a circular economy, rather than a linear one, focuses on a framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution (Ellen MacArthur Foundation, 2021). A circular economy generally has three main principles: eliminate waste and pollution, circulate products and materials that are in good condition, and regenerate nature. However, with this groundbreaking law in place, it is not a bulletproof solution, and health scandals following packaging issues have developed. Unfortunately, supermarkets found a loophole within the system, and still are receiving a tax break on the goods they are donating even if they are already expired.

Every year, around 20 million promotional brochures are sent to the mailboxes of French citizens with endless discounts and multi-buy offers for customers at different supermarkets (Elie, 2021). This attempt to lure consumers into grocery stores through permanent discounting unintentionally affects unstable consumption rates in France, and ultimately leads to waste. This also allows for retailers to have justifiable excuses by claiming that half of the recipients of these brochures read their publicity, and one third of them make their decision on where to purchase their food based on these special offers (Elie, 2021). The method of permanent discounting leads to food spoilage because discounted food leads to faster consumption, resulting in "prices no longer reflecting the cost of labor that goes into producing the food, but the volumes that manufacturers bring to market" (Elie, 2021). Wasting food also wastes the many efforts it takes to bring that food to market, such as growing, harvesting, transporting, and packaging processes. In France, responsibility for food waste is split four ways. Producers contribute to 32 percent, processors 21 percent, retailers 14 percent, and consumers 33 percent (Elie, 2021). However, in 2020, France adopted a comprehensive Anti-waste Law, devoting its efforts to fix production, distribution, and consumption systems (Ellen MacArthur Foundation, 2021). Statistics show that in 2020, France produced the smallest volume of waste since 2010, emitting 315 million metric tons that year

which is 10 percent less than 2018 data suggests (Statista Research Department, 2022). Even though this new law is showing a positive outcome, it is still not enough of a change, especially in a developed nation.

France has a sophisticated distribution network that the EU relies on for a multitude of its products, which are mainly agricultural. According to The French National Research Institute for Agriculture, Food and the Environment (INRAE), of 30,000 packaged foods, more than two-thirds are ultra-processed (Elie, 2021). This means that they have been made using manufactured ingredients, rather than actual foods. Ultra-processed foods can be digested quicker, creating the effect of feeling less full after consumption. The amount of ultra-processed foods in comparison to fresh foods produced on farms, causes nearly half of all adults to suffer with weight issues (Elie, 2021). The people of France in response to this alarming statistic have taken it upon themselves to create Associations for the Maintenance of Peasant Agriculture (AMAPs). In these associations, the consumer makes a weekly commitment to buying local, unpackaged, and seasonal produce (Elie, 2021). The benefit for the consumer is that they are guaranteed a stable income and have the opportunity to select varieties of food for flavor rather than yield. These organizations also represent a real life model of how regulating the quantity France produces to what they eat could lower prices of major retailers drastically. Being that there are currently about 300 farms in close proximity to France with close connections with their customer base, implementing urban agricultural practices would benefit food sufficiency (Elie, 2021). However, urban agriculture alone isn't enough to feed an entire city population, let alone a nation. With that being said, it is extremely important to focus on a singular geographic region of France, rather than the whole country to implement these new practices. In doing this, it ensures the success rates of these solutions. The Paris Basin Region in France is home to 22 million people. Being that this region has access to arable land, neighbors one of the most populated areas of the country, and runs along the Seine River, this region is perfect to be the first to experiment new practices that directly combat food waste and spoilage.

The 2016 Anti-Waste legislation was passed to prevent food waste in supermarkets. However, there is also a need for new regulations to ensure that these supermarkets are donating their products the correct way, and not just for personal gain. To guarantee that this law is followed and a positive impact is occurring, all supermarkets in the Paris Basin region should be required to partner up with the BEEP app. This app is dedicated to preventing unnecessary food waste and spoilage with its simple product recognition technology through bar code scanning. With over 20 million registered products, and 60+ countries using the app, BEEP simply scans the barcodes of food products and tracks the expiration dates of the inventory (BGPworks, 2021). When there are new shipments of products into the grocery stores, the workers should be required to scan each individual item. Once that is done, the goods will then automatically be registered into the BEEP app. Most of the food products that are being donated because of the establishment of the Anti-Waste legislation are distributed to thousands of local NGOs, as well as the Salvation Army. Unfortunately, since thousands of goods are being transported to the food bank, which is a mostly volunteer run operation, it is a race against the clock to collect, sort, and then distribute food while it's still viable (Saltzman et al., 2019). The new regulation that France has to pass will include mandatory use of the BEEP app for any and all supermarkets who donate their products to food banks in the Paris Basin region, as well as the recipients of these products, such as NGOs and the Salvation Army.

With every legal proposal, loopholes are anticipated to be found. For instance, even if public checks were intensified and apps such as BEEP were mandated, there is always uncertainty that every single item will be accounted for. Even if supermarkets track their inventory, they can choose to not scan all of the food that is imported into their stores, in order to receive the 60 percent tax break without getting caught. The law calls for stiff penalties of about \$4,000 each time a store is caught throwing away donatable food, but as of 2019, no one had been fined (Saltzman et al., 2019). One would think that there is a substantial

amount of officials to carry out these well needed public checks, however, the number of inspectors at France's agriculture ministry has been cut by 11 percent since 2007 (Elie, 2021). Scandals involving contamination and fraud have also increased due to the complexity of supply networks (Elie, 2021). Although there seems to be inconsistencies with following the requirements of this particular legislation, if it is followed accordingly, then positive results should be obtained. The partnership between these French supermarkets and BEEP is planned to be of mutual benefit for one another. It is to be funded through NGOs, as well as the over 450,000 teams involved with this company already. Five and a half million people in France rely on food aid, which more than doubled between the years 2009 and 2017 (Elie, 2021). The ultimate goal is for food banks, NGOs, and the Salvation Army to receive usable, fresh food for people who depend on food aid to support themselves, and their families.

Like many forms of discounting, the intention is for the public to find the most affordable price of the specific item they are in search for. However, permanent discounting is different, and can result in the process of overproduction and the acceptance of food waste. This particular type of discounting increases the rate that products spoil due to the high demand in which they are bought. Supermarkets in Paris Basin need to replace the endless discounts and multi-buy offers that they are placing into their citizens' mailboxes every year, with loyalty programs that promote buying local. Eating locally grown foods have many benefits not just for the consumer, but the grower, and community. Some of these benefits include, supporting the local economy, growing more nutrient rich foods which are seasonal, and local growers having the ability to use safe practices when harvesting their crops (Elie, 2021). The loyalty programs that French supermarkets need to implement should include the option to view how their food is being grown, their nutrient level, and what, if any, artificial solutions are used to aid along the growing process. Pamphlets should include pages used for educational purposes that allow the recipients of these brochures to self inform themselves on the benefits of buying local, as opposed to participating in multi-buy offers with major retailers. Loyalty programs should be available free of charge to encourage as many citizens as possible to sign up, and regain stability in the rate in which supermarkets produce and purchase their products.

Since the discount leaflets are mainly sent out via French supermarkets, the transfer to loyalty programs filled with educational information will be funded through the same stores. It is inevitable that these supermarkets will be stuck in their ways, and may not agree with the implementation of such programs, however, educating the consumer base will ultimately stabilize the rate in which they have to buy their goods, and lessen the demand of their products as a whole. Unfortunately, as of now, there is no regulation nor state intervention that tries to match what France produces with what they eat (Elie, 2021). In other words, overproduction will continue to occur, which results in food spoiling on the shelves of supermarkets at alarming rates. In the end, this goes hand in hand with the issue of expired food being donated to food banks, resulting in NGOs gaining an unfair tax break. If the biggest challenge is convincing these supermarkets to redirect their efforts into promoting the importance of where their food comes from to avoid food waste, then I think that is the least of our worries. Especially if this means that the supermarkets will maintain a balance between the rate at which the French produce, with what they consume.

The sad truth is that a city's immediate surroundings are rarely enough to support its needs. Even if AMAPs become more prominent within the country of France, their efforts alone will not be enough to promote the idea of transitioning to urban agriculture. Creating an AMAP, maintaining unoccupied plots of land, and converting wasteland into market gardening will all help raise awareness of food issues to citydwellers, however without more aid, these "solutions" will not fix anything (Elie, 2021). Since politicians play a major role in facilitating access to land, discussing new ideas that adopt urban

agricultural methods, along with ideas of hydroponic farming will make a serious difference in how France faces food waste issues. France imports 20 percent of its food, making it dependent on other countries to provide for its citizens (Elie, 2021). With that being said, if France decided to close its borders, French farms would be able to feed the population, as long as they gave up tropical products which are imported from other countries. Since this is not an ideal way to combat the food waste issue, by using hydroponic farming technology, French farms, starting in the Paris Basin region, would be able to grow unseasonal tropical products in their own backyard, which will replace the imports coming from other nations. In general, plants native to the area of growing will do best in hydroponic gardens (Hydroponic Way, 2022). Although, there are some exceptions to this rule such as providing the specific crops with the exact climate they need. In addition, farmers will need to monitor the humidity levels in their hydroponic systems, and ensure they stay within the ideal range for their particular plants. Being that the Paris Basin region is in close proximity to Paris, and it is a popular agricultural area, there will be plenty of accessible land to build hydroponic farms. This region is also moderately wealthy, so cost would not be an issue. Hydroponic farming uses as much as 10 times less than traditional field crop watering methods as well, which would benefit farmers year round.

Farmers shouldn't be required to pay for these hydroponic setups, especially with France's slowly growing economy, which contributes to its struggles. NGOs and AMAPs dedicated to the cause would fund the majority of these projects, with the overall goal of urging politicians to push legislation regarding the mandation of hydroponic farmers, alongside urban agriculture. Being that impoverished districts such as Corsica, are the most disadvantaged in the country, they are top priority for these solutions to be put into practice. However, without funding, they would not be able to properly utilize these programs. With that being said, it is necessary to come in contact and partner with The French ministry of Agriculture and Food, who coordinates the Government's policies on agriculture. With their assistance, promoting loyalty programs, as well as placing mandates on the use of the BEEP app in grocery stores would be that much easier. With NGOs, AMAPs, and the help of The French ministry of Agriculture and Food, hydroponic systems would be feasible as well. Compromises such as, administering these solutions to select regions at the start, rather than the whole country to ensure its success is vital. Building credibility with the government is significant in order for these applications to work. If France can subsidize its reliance on other countries to support them from an agricultural standpoint, then discussions related to food self-sufficiency would be that much more meaningful. The downside to hydroponic farming is that, "to date, neither France nor the EU has plans to redesignate food as a political priority" (Elie, 2021). Furthermore, even if regulations on French farms were established, half of France's population currently lives in an area where there would be too little agricultural land to feed everyone, even if every productive hectare was converted for this purpose (Elie, 2021). On the flip side, trends are showing that the average hectare size of farms in France are increasing at a significant rate. Also, if millions of pamphlets promoting buying locally are passed out in the mailboxes of French citizens, then we can only assume that there will be an incline in the number of residents that are making conscious efforts to reduce the amount of waste that they produce.

Over the years, France has led the way with implementing many laws in favor of decreasing their waste production as a whole. This includes the supermarket ban on throwing away unsold food items that could be donated to charities, which promotes the idea of a circular economy, and The Anti-Waste law. There is no doubt that the French are becoming more educated and mindful of their contributions to the issue of food insecurity. According to an online survey from 2020, the four main benefits French citizens associate with shopping at specialized local food stores are that they make city centers more dynamic, create strong social connections, provide opportunities for local producers, and participate in the development of territories (Jeudy, 2020). With this statistic in mind, it is clear that French citizens are on board with resisting the waste problem that plagues their nation. In order for these solutions and measures to work,

there has to be a method of transportation allowing for these goods to be delivered to marginalized communities. Supermarkets will be in charge of the majority of these solutions. In regards to the BEEP app, NGOs and Salvation Army, who were originally head of these processes, and will remain in control. Along with brochures promoting purchasing locally, supermarkets will administrate how many are sent out to the mailboxes of French citizens per year, and ensure that locally grown goods are an option for consumers. Furthermore, when hydroponic gardens are authorized, Paris Basin farmers will team up with AMAPs, who promise their consumer base a stable income, along with a variety of options to choose from. Transporting tropical products grown in these hydroponic systems will be a part of their program to support their consumer's needs. With low income families receiving the brunt of this problem, it is imperative that action continues to be taken, and more steps are put into place to defeat this obstacle in its entirety.

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