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Are We Aware as a Nation **How Much We Rely on** **Other Countries for Fresh** **Produce?**

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Declaration

1. This work has not been previously accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.
2. This dissertation is being submitted in partial fulfilment of the degree in Business and Management requirements.
3. This dissertation is the result of my own independent work and investigation, except where otherwise stated.
4. Other sources are acknowledged by references. A bibliography is appended.
5. I hereby consent for my dissertation, if accepted, to be available for photocopying and interlibrary loan and for the title and summary to be made available to outside organisations.

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Abstract

Again, we as a nation face food shortages due to many unpredictable events happening worldwide, such as Covid-19, political wars, the rising cost of living and the conflict between countries. The U.K. and other countries are already facing the threat of shortages of food supplies because of the reliance on other countries for these goods. Therefore, there is a considerable concern when we depend too much on imports for "Fresh" produce.

The increased damage to the planet caused by climate change is widely known worldwide; however, do people understand the extent to which the damage has been generated, will continue to develop and how human activity is responsible for the harm? Therefore, A solution has been considered for sustainability, the long-term aim of reducing food waste, and an interest in growing your own produce.

The aim of the research will provide insight into consumer behaviour regarding waste and the attitude and education towards a more sustainable future by growing your own.

The data will be obtained by conducting a primary research method to gather a broad view of the phenomenon before quantitatively analysing the evidence. A quantitative questionnaire approach was used to collect the data. The questionnaire received 100 respondents, and the information was examined to understand consumer behaviour and attitudes using cross-tabulation to establish any correlation between numerical variables.

The investigation revealed that the participants between the ages of 18-44 lacked education on sustainability, waste, and where their food comes from. There needs to be more education introduced into schools, colleges, and the public, with much more marketing on climate change and sustainability.

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Chapter 1: Introduction

Nearly 200 years ago, during the industrial revolution, the linear economy was created, where natural resources are wasted and disposed of when no longer needed. A take-make-dispose economy Vieira (2015), Since then, we have moved into a circular economy with the aim of everything being recycled, tackling climate change, and reducing damage. (Ellen MacArthur Foundation, 2023). - An organisation that works with businesses and others to develop a circular economy.

According to an article by BBC (2023), The climate is in a state of distress, with extreme weather temperatures hitting new records, for example in 2022, the weather was recorded as the hottest weather ever, resulting in the loss of the arctic sea with melting icebergs causing a rise in sea levels. Deforestation is also a considerable concern; half of the amazon forest emits more carbon than it absorbs. The UN's Climate Science body reported in 2021 that the IPCC – Intergovernmental Panel on Climate Change expressed that human activity is the cause. Scientists state that reductions are needed to keep global warming below 1.5C to protect ecosystems and the planet. (Gerretsen, 2023).

In 2018, an online article by the UK Parliament (2021) stated that 9.5 million tonnes of food was wasted, and in 2019, 931 million tonnes. (Dray, 2021).

Population growth is predicted to increase by 2 billion by 2050. In November 2022, the world's population reached a staggering 8 billion compared to 2.5 billion in 1950. Three times larger than in the mid-twentieth century. (United Nations, 2022).

By growing food locally or even better by yourself, some issues we still face could potentially become solved. Below demonstrates that centuries ago, they had no choice and made it work. It was a success which I'm sure saved many lives.

A Timeline of Britain's Food.

- Since the Mesolithic era (10,000 – 4000 BC), many food varieties have become available in Britain. However, back in that era, hunters would search for edible species native to the British Isles, such as wild animals, birds, fish, leaves and fruit plants.
- During the Neolithic period (4000-2200 BC), cattle and pigs were brought to Britain's isles and cultivating crops began for wheat and barley. In this era, discovering islands on earth through exploration resulted in imports and the beginning of trade.

- Throughout the Bronze Age (2200-800), fields became a priority for growing crops and vegetables.
- During the Iron age (800 BC-AD 43), Romans brought wines and vines to Britain; however, there were claims that Cornwall had wine imported earlier.
- During the Roman Period (AD 43-400), exotic fruits, nuts and veg, herbs, garlic and flavourings came to Britain.
- During the Middle Ages (400-1485), western Europeans discovered sugar as an expensive luxury until the 18th century.
- At the time of the Tudor period (1485 – 1603), turkeys were raised in Britain in 1541, with potatoes arriving in Britain from Spanish explorers in 1570: in this era, rice was known as a pudding.
- During the Stuart Period (1603-1714), at the end of the 15th century, orange trees were brought to the Mediterranean area. After that, coffee and Tea became an expensive luxury until the mid-17th century. (English Heritage, n.d.).

Historically, allotments were set up in 1790 when society fell to its knees from post-war food shortages, starvation, and failed harvest situations. In 1830 Garden expert John Loudon believed one-eighth of an acre would provide enough food to harvest for a family of 5. However, the only way for poor people to have fresh fruit and vegetables would be if they grew their own, causing a dehumanising industrialisation by the wealthy middle class. In 1885 a chemical fungicide formalin was introduced, and gardening magazines with information and techniques on how to grow gripped an interest of a broader market. Sixty years of change within industrialisation turned Britain into an urban nation, and behaviour towards food changed. And in 1897, The royal Horticultural society celebrated Queen Victoria's Diamond Jubilee. Arthur W Sutton delivered a paper during her reign announcing the progress in vegetable cultivation of the new varieties of vegetables introduced in the 60 years. For centuries, most people who resided in the country would grow their own produce. However, by the end of the 18th century, enclosure acts combined with massive population growth and the specialisation in agriculture left much of the rural population with no land or employment. As a result, attitudes changed from saving families from hunger but instead to shopping centres. (Edwards, 2019).

In 1908 local authorities were ordered by law to provide land for allotments because people who had volunteered during 1899 -1902 'Boer war' had been rejected and deemed unhealthy due to a lack of nutrients, causing a threat to the empire. In 1914 when men went to war, grow your own heightened and the term 'grow your own' originated from a published manual in 1918. Before this, 80% of food relied upon imports. Germans cut supplies; however, the defence of realm act in 1914 created a new power requiring land for growing

produce. By July 1918, there were over 1.4 million allotments in the UK – many of them run by women. They produced food all year around, fruit grown in greenhouses and on walls heated by flues and pipes from within the walls. Many fruits and vegetables were grown under glass so that particular fruits and veg can be enjoyed throughout all seasons, not just in their specific season. In addition, using the newly constructed railways and post system made ordering and transporting seeds easier and cheaper. (Edwards, 2019).

Between 1919 and 1939, around 4 million homes with gardens were built in England and Wales, enabling families to have a garden for the first time in 1938 despite the depression, average earnings were up by 30% than in 1913 and growing your food was no longer looked at as a priority and began to become lost along with the growing knowledge and techniques: The only advice left available would be from a wireless (radio) on a Sunday afternoon. In 1939, the use of allotments was also affected when there were estimated 750,000 fewer plots than in 1919. In 1939, reliance on cheap imports concerned Britain immensely when preparing for World War II. The agriculture ministry took action to avoid food shortages again, and a 'dig for victory campaign began. Supplying information showing gardeners how to dig, sow seeds and other techniques. Growing your own again became a priority, allotments doubled, and by the end of World War II, Britain was feeding more people on its own soil than any other country worldwide. (Edwards, 2019).

1.1. The Research Purpose

With the daily unforeseen events, such as COVID-19, Brexit, political wars, climate change and global warming, can each individual make a difference in reducing their carbon footprint and becoming more sustainable? Unless a change happens, an article by (WHO) World Health Organization (2023) stated that by 2030 climate change is predicted to harm health, water, air and the food supply. It is estimated that between 2030 and 2050, 250,000 deaths will be caused by climate change, heat stress, and poor diets. The damage to the planet will be detrimental, with an estimated **\$2/\$4 billion per year** in health costs by 2030. (WHO,2023).

Will there be a planet in the future? Change needs to happen; it is critical for future generations. Throughout this investigation, I will investigate people's knowledge and establish if it is possible to return to old ways and follow in the footsteps of history, growing your own or at least growing locally.

1.2. Research Questions and The Dissertation Structure

Establish consumer behaviour regarding overbuying and waste. Investigate if people know where their food comes from and how much is wasted. For a change to occur, does there need to be more education out there? As established above, when people knew information and techniques on how to grow, they did grow. For example, when the country was under pressure regarding food shortages due to the wars, Britain managed and began to produce their produce, relying upon itself. Can more education on waste, climate change, and growing your own produce reduce waste and improve the planet? This will be established through the construction of the methodology chapter gathering primary data from a questionnaire.

The findings, analysis and discussion chapters will evaluate different consumer behaviours and attitudes analysed by statistical analysis.

Chapter 2: Literature Review

This section will investigate the food industry and the importance of sustainability in food for future generations. The study's ontology will analyse consumer behaviour and the patterns and adaptations we can make to benefit the planet in more ways than one. This research will answer two of the following objectives:

- Investigate if we as a nation know how much we rely on other countries for fresh produce and how much we waste of that amount.
- Analyse different approaches which can be sustainable for future generations, health, and the planet.

2.1: Food Waste and the Causes

An article by the guardian (2018) states that 66 tonnes of food waste is thrown away every second, and by 2030 according to a report by BCG (Boston Consulting Group), a new analysis warns that food waste/loss is expected to increase by a third. (Guardian, 2018).

House of Lords Library for the U.K. Parliament stated that a report in 2022 by the Charity Waste and Resources Action Programme (WRAP) said that around 9.5 million tonnes of food are wasted. Furthermore, 70% of waste is caused by human activity, and 30% is inedible. Dray (2021). Business waste online (2022) also states that the U.K. disposes of around 9.5 million tonnes of food waste annually. The United Kingdom produce the most significant amount of food waste in Europe. Billions of pounds each year are wasted when food is disposed of unnecessarily, with over half the food produced globally going to waste. (Business Waste Online, 2022)

An online article, The Eco Experts (2023), stated that the Waste and Resources Action Programme (WRAP) said an exact 9.52 million tonnes of food is disposed of each year, emitting a total of 25 million tonnes of Carbon dioxide. The article also stated that 40% of food produced globally is wasted, resulting in 2.5 billion tonnes a year, with 6.4 million tonnes of edible food disposed of yearly, totalling 10.5 billion meals. (Jackman, 2023).

60% of food waste comes from homes within the U.K., and 40% from businesses and the hospitality industry. (Business Waste Online, 2022).

There are four categories of food waste:

- By-products such as solid and liquid foods. Foods which are produced through manufacturing, production processes and agricultural practices. Including all cuttings and peelings from fruit and vegetables.
- Expired products sold by supermarkets and shops. Products which are out of date and no longer edible to consume.
- Package food waste from unsold fresh produce and bakery items.
- Households, restaurants and shops cause food waste.

There is an alarming warning that consumption is increasing with the population's growth. Asia is a country which is an example of this. As wealth grows, people demand more food. (Guardian, 2018).

Food waste from homes can be caused by buying almost what seems to be in bulk, for example, packs of produce, including more than one: This can include any fresh produce, carrots, for instance - a bag of carrots usually sells as a pack, but if sold individually, this would hugely cut down on the amount of waste. Consumers are also buying too much and not consuming it within the product's cycle life due to a lack of awareness of expiry dates. There is also a lack of education on how to meal plan and prepare and cook meals without having any leftovers. (Materials Recovery, 2022).

Strategies to stop this would be more education available on reducing waste with incentives in place, such as having the opportunity to buy products individually and at an even lower price. In addition, if there were more education on sell-by dates and meal planning, this would reduce the need for home waste.

Compost all peelings; any vegetable peelings can be used as compost in gardens, purchasing imperfect misshaped fruit or veg instead of ending up in a landfill. (Mayo Clinic Health System, 2021).

Food waste caused by shops and supermarkets is generated from ordering too many products that won't sell. Businesses are quick to stock up if their supplier is offering a good deal without considering the adverse effects it has if these products don't end up getting sold. There is also poor education regarding how we should dispose of food. For example, a lack of awareness of expiry dates results in foods left to spoil instead of being used. Most of all, waste ends up in landfill resulting in food items degrading naturally over time, breaking down and releasing methane gases which contribute heavily to global warming and the erosion of the ozone layer. According to the EPA, methane traps heat within the atmosphere and is also 25 times more harmful than carbon dioxide. (Business Waste Online, 2022).

Waste not only has a considerable effect on lives and the climate but also causes inflation of the price of food resulting in a weakened food supply chain. Popular food retailers have good relationships with farmers, suppliers, and consumers, so they stand in a good position where they can positively influence the supply chain and address the global issues with food. Retailers can implement strategies to control waste more sustainably, manage challenges, strengthen partnerships with suppliers and build a strong rapport with customers to understand what they want. (Kor et., 2017).

Smart business planning strategies include upgrading to innovative technologies that can manage inventory systems that track the product and its shelf life, cutting down on what ends up as waste. For example, according to Harvard Business Review (2017), in an online article, in the US, about 7% of produce is left unharvested every year because farmers grow more than needed due to unpredictable events, weather etc. If retailers collaborated and partnered with farmers, this would reduce the amount of waste from agriculture. In addition, businesses could offer imperfect wasted food at a discounted price. For example, restaurants could offer a variety of plate sizes to avoid waste or donate any waste to the homeless at the end of the service. Furthermore, teaming up with consumers could change habits; according to Harvard Business Review, young people do not know what to do with leftovers. (Kor et., 2017).

Finally, offering education such as magazines on how to utilise portions, how to meal plan and how to prevent hunger could reduce the amount of waste needed to go to landfill.

2.2: Consumer Behaviour and Food Waste

Consumer behaviour is vital in how we change. Therefore, recognising and analysing themes and trends within consumer's attitudes and behaviours will give an understanding of how to strategize for the future and change direction.

From 2005 – 2021 consumer spending has increased year by year. There was a slight fall in 2020 when the Covid-19 Pandemic hit. However, in 2021 consumer spending in the UK increased and totalled 1.33 trillion British pounds. (Sabanoglu, 2022).

According to a research organisation, Refresh stated that changing consumer behaviour is urgent. Public campaigns and other policy instruments can easily influence consumer behaviour and positively impact the amount a consumer wastes. (Wunder, 2019). However, according to a research organisation, RAND corporation, understanding food consumption trends and attitudes is crucial to positively change consumption practices. Although a small number of consumers are aware of health and diet, most are still uneducated on nutritional guidelines, and many do not always follow what they believe. In addition, people are

influenced by culture and social environment. What we eat is a matter of habit and convenience. The food environment constantly changes, and although socio-economic has differences across broad consumption trends, the impact of wider socio-demographic factors is less clear. Powerful food system actors are a huge influence regarding consumption. (D'Angelo et al., 2022).

Consumer behaviour is changing; according to the Guardian (2018), consumers prefer to buy fresh rather than frozen, believing fresh is healthier. (Guardian, 2018). Buying patterns show that each consumer thinks differently and has their own buying patterns. For a business to expand its target market audience, consumer buying patterns are critical to recognise, analyse and measure to have a clear understanding resulting in sales. Buying patterns are psychological and are defined by habit, timing and purchasing quantity. Consumers are influenced by the area they are in, recommendations by others, income received, the price of the product and so on. (Decker, 2020).

There are Four consumer behaviour trends. These are categorised as:

- Routine purchases, for example, weekly food purchases.
- Limited decision-making purchases, for example, A haircut.
- Extensive decision-making purchases, for example, A car.
- Impulse decisions – buy what you see.

Businesses can use tools such as Google Analytics, social media, Hubb spot (CRM), and service Hubbs to analyse consumer buying patterns. (Decker, 2020).

Emerging trends in customer behaviour can be a high demand for transparency on ingredients and the supply chain. Since the pandemic, Increased purchases online have proved to be convenient with the delivery options. For businesses to stay current and ahead of their competitors, they must build an online marketing strategy. Consumers are also more conscious buyers and only purchase what is needed and a priority. In addition, consumers are more particular about what they receive and expect an experience, not just a product. (Forbes, 2021).

According to Forbes online (2021), consumer behaviour changes and can sometimes become unpredictable: It must be considered that although a strategy seems successful when tested in reality, it may not be effective at all. However, quickly recognising behaviour patterns can give businesses the knowledge of what their customers want and expect, giving the company a competitive advantage over their competitors. (Forbes, 2021).

2.3: Food and The Farming Industry

The farming industry has had detrimental effects due to Brexit and the impacts on Britain's borders. Since Britain left the European Union, farmers in England are already facing the loss of the BPS (Basic Payment Scheme). However, for now, Wales, Northern Ireland and Scotland remain to receive the payment. In July 2021, In the Farmers weekly (30th July, 2021, p.30) published a survey showing results that 95% of farmers received the BPS payment with the sum ranging from 30,000 and above depending on the size of the farm and the number of acres it has. Although the Sustainable Farming Incentive scheme (SFI) will become available through the Government's Environmental Land Management scheme (ELMs), it is unclear how much farmers will receive. At most, it is estimated they will only make up about a third of BPS through ELMs causing uncertainty for their futures and concern for how their businesses will survive without the BPS. A weekly farmer's poll stated that 53% of farmers said it would be difficult for them to replace the lost income, and 26% stated concern and worry that they could not. (Landzettel, 2021).

Due to global pressures, farmers have also witnessed increased agricultural fertiliser and feed prices. These pressures are because of increased demand, the war with Ukraine and energy costs. As a result, there are currently limited supplies of materials. Governments have announced they will offer a sustainable farming initiative to support and help farmers to manage their land and improve production for a sustainable environment. (Eardley, 2022).

Farming chiefs have warned that Brexit has caused a decline in crops, which means fewer locally grown products are supplied to supermarkets. An Independent article (2022) stated that Farmers in Kent have expressed to MPs how much easier it is now to import fruits than harvest them due to the new limits now being in place regarding the number of seasonal workers allowed to work from the EU. (Forrest, 2022).

2.4: Food Imports

The UK relies heavily upon other countries; according to an article by Glotech (2018). The UK depends on nearly every country in the world. The research was based on imports to the UK from around 191 countries; this was for almost anything that could be consumed. In six months of 2018, 23 billion pounds of consumable products were imported.

Below is an image analysis of HM revenue and customs data on food items imported to the UK from every country in the world in 2018. Data Sourced from UKTradeinfo.com. (Glotech, 2018).

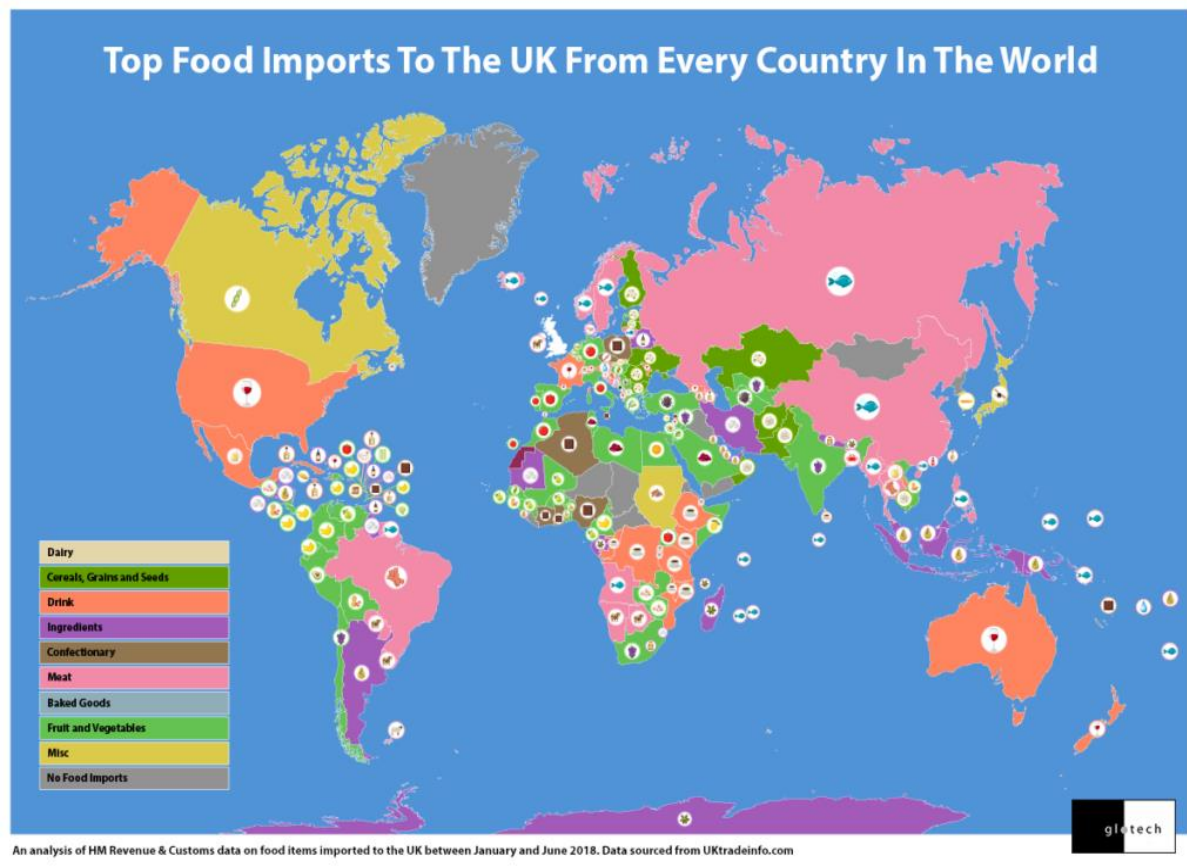


Figure 1: The UK's Top Food Imports and Where They Come From. (Glotech, 2018).

Spain exports most food and drinks to the UK out of anywhere in the world with a total cause of imports in six months equalling an amount of £1,028,207,497. We receive a range of food from other countries, such as potatoes from Belgium and the Netherlands. We receive tomatoes from Morocco and Portugal. Sweetcorn from Hungary and Senegal. Cauliflower and broccoli from Jordan. Dried fruit from the Kyrgyz Republic. Blackberries from Montenegro. Raspberries from Serbia and peppers from Spain and Sint Maarten. (Glotech, 2018).

Although some vegetables and exotic fruits can't be grown in the UK due to temperatures etc., that does not excuse the fact that we heavily rely upon foods from other countries that can be grown here in the UK all year around. According to garden organic, although the UK has distinct seasons and can be challenging, with preparation and careful planning, there can be a range of fruits, veg, salads, and herbs grown at home. Simple tips and tricks to extend the growing season can also be an option to ensure crops are protected throughout the winter months. (Garden Organic, 2022).

The UK imports more than it exports, which means it runs at a trade deficit. An overall trade deficit was 18 billion in 2021. The UK's exports totalled 636 billion in exports and imports

totalled to 654 billion. In q2 2022, there was a deficit of 33.8 billion compared with a deficit of 43.9 billion in q1 2022. (UK Parliament, 2022).

The above statement proves how a trade deficit can affect the country's economy and cause suppressed inflation.

2.5: Advantages and Disadvantages of Imports

In 2021, £10.46 billion British pounds was the total of imports and exports in the UK. In 2009, the value was £8,577 billion. The sales value of fruit, vegetables and nuts produced in the UK was £108 million. The producer price index of fresh fruit in the UK is £159.5, and fresh vegetable production value in the UK is a value of 1.6 billion GBP. The figures above show how heavily the UK rely upon imports and how it has continued to have increased over the years. (Shahbandeh, 2022).

International trade: The import value of fresh fruit into the UK is GBP 3.73 billion, and the import volume of fresh fruit to the UK is 3.33 million metric tonnes. The export value of fresh fruit from the UK is 363 million GBP, and the export volume of fresh fruit from the UK is 37,000 metric tonnes. (Shahbandeh, 2022).

In 2020, consumer spending on fruit and vegetables increased. One-quarter of the UK consumes between 1-6 fruits, berries, salads and veg in a week, with 5th of consumers eating three portions of fruit and vegetables daily. Consumption annual expenditure on fruit in the UK is 10.55 billion GBP. Annual expenditure on vegetables in the UK is GBP 15.83 billion. £225.17 million is spent on chilled prepared food in the UK. (Shahbandeh, 2022).

The UK's reliance on climate vulnerable countries could affect the availability, price and consumption of fruit and veg in the UK negatively concerning the diet and health of older people and low-income households. (Scheelbeek et al., 2020).

Due to high water content, fruit and veg deteriorate. Therefore, many methods have been tried and tested to increase shelf life. Osmotic dehydration is one of the most suitable processes to improve the shelf life of fruit and veg. (Yadav, K, A & Singh, V, S). In addition, fruit and vegetables are waxed to avoid decay and bruising during transportation. Can waxing and other preservatives be harmful to health?

2.6: Shortages of Food, Poverty and Climate Change

Over the past few years, many unpredictable events have occurred worldwide, such as Covid-19, political wars, and the conflict between nations. As a result, the UK and other countries are already facing shortages of food supplies because of reliance on other countries.

It has been stated by The United Nations Food and Agriculture Organisation that around 815 million people were affected by undernourishment in 2016. (Guardian, 2018).

Figures from WRAP, 2019 (Food Waste in Primary and Production in the UK) stated, around 7 million people in the UK (1 in 10 of the UK's population) are struggling to afford to eat. That's around 5 million adults and 2 million children! According to the government figures and the food foundation, this is up by 2 million because of the covid 19 pandemic. (Fare Share, 2022).

Around 8.4 million people in the UK are living in food poverty. (Business Waste, 2022).

The amount we waste equals around 2 million tonnes of good-to-eat produce as a nation; this would equate to 1.3 billion meals, resulting in enough food to feed people in the UK who are living in poverty for up to 6 months. There are around 1.3 billion meals which go to waste that are still edible to eat each year. Food that is still edible and can still be consumed is called surplus food. Food surplus is due to overproduction, labelling errors and shelf life. Surplus food occurs everywhere in the supply chain, including farms, processing, manufacturing, wholesale, distribution, and retail. (Fare Share, 2022).

Can surplus food be donated to impoverished families instead of ending up in landfills?

The UK population is predicted to increase by an estimated 50%. From 64.6 million in 2014 to 74.3 million by 2039 due to net Migration. Net Migration impacts the UK's population, wages, economic growth, and tax revenue. Although there has been a drop in new EU migration due to Brexit, there has been a rise in non-EU Migration. (Pettinger, 2021).

Global greenhouse gas emissions caused by the production and transport of imported and exported goods have increased to an average of 20-30%. However, the overall impact of trade on carbon emissions is too complex to measure. According to the World Trade Organisation (2022), energy, and transportation account for 75% of greenhouse gas emissions embedded in international trade. It has been announced that Energy efficiency technologies and policy environmental initiatives can reduce greenhouse gas emissions. (World Trade Organisation, 2022).

According to (FAO) The United Nations Food and Agriculture Organisation, food loss and waste contributes to around 8% of the cause of global warming. Guardian (2018) which is compared to emissions released by one-fifth of vehicles on the road in the UK. (Materials Recovery, 2022).

Although plans are being implemented to control emissions, accumulating less waste, and growing what we can locally instead of relying on other countries can significantly reduce these emissions, benefiting lives and the planet in more ways than one!

2.7: New Approaches

Throughout pre-history, during the Neolithic period, foraging food reduced carbon footprint by becoming energy and self-efficient, producing no waste, and living sustainably. Foraging food is one of nature's delights which provides nutrition, flavour for food, and even medicines. Many berries, such as most summer berries, can be found locally, as well as mushrooms, nuts, herbs and much more. (Yates, 2021).

Growing your own and growing more in the UK could benefit health by becoming in control of pesticides; it may all positively affect and cause less pressure on NHS in the long run. People have already become interested in growing produce and are starting to rely less on supermarkets due to the increased cost of living. In 2022, According to Author Mark Ridsdill Smith, the "Vertical Veg Man" a well-known YouTuber and popular website creator, stated you can grow up to 90kg per year, equalling over 14 stone of food a year! Money-savings of around £11,000. The food can be grown anywhere inside or outside a property, such as on windowsills, balconies, outside patios, walls, and greenhouses. (Smith, 2022b).

By offering more awareness and knowledge to consumers regarding the issues we face, as seen above, people may become more aware of how they spend. With the proper support and guidance, growing your own produce could become the norm again like it once was. Supporting farms by offering alternative farming techniques could give the potential to provide local produce while also encouraging family homes to grow; this may all potentially benefit and reduce the risk of crippling the UK agricultural industry.

Chapter 3 – Methodology

The Literature review examined two objectives to understand if we as a nation know where our food comes from and if we recognise our behaviour regarding how much we waste. This research study was chosen to explore a deep understanding of how people perceive the planet regarding climate change, poverty, the effects on the farming industry and much more. Should we as a nation be doing more to become self-sustainable to protect future generations from any unforeseen events that may take place? Just like the barrier effects during Covid 19 and the climate crisis. Therefore, this chapter aims to achieve the third objective:

Are people educated enough? Can we be sustainable as a nation? Can we support local and grow our own produce?

The Research will collect consumer behaviour and awareness data to determine the barriers to more sustainable living or how we as a nation are aware of our food journey.

According to a paper published by Oxford University Press (2016), Social Research is conducted to understand what goes on in society and how it can be resolved. Social Research enables questions to be asked in a social environment to understand modern social life better. (Bryman, 2016).

To guide the methodology, The Saunders Research Onion framework, would be followed to achieve and determine an approach to gain significant results. A systematic approach builds on a research philosophy that uses methods based on several techniques and strategies. Below is a diagram of the framework justifying its layers in which each layer covers one part of the study. There are six layers (Alturki, 2021).

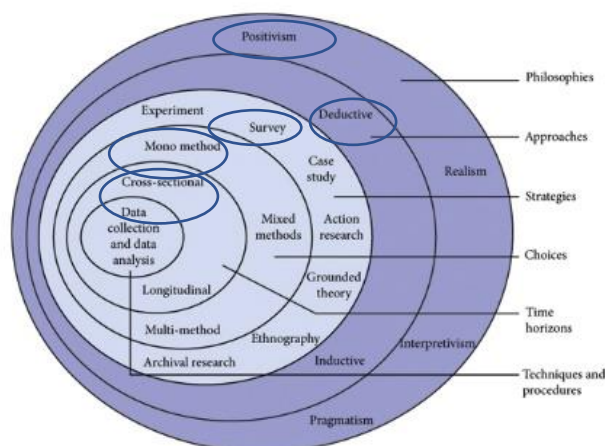


Figure 2: Saunders Research Onion. (2021).

3.1. Research Philosophy

The process will be followed in a positivist philosophy with a deductive approach to develop a hypothesis and research strategy based on an existing theory. (BRM, 2023). A positivist epistemology is a scientific study of the social world. Its objective is to formulate laws and change within the social world. Developing rules from data stating that knowledge of a social phenomenon can be observed, measured, and recorded, like natural science, is a way of gaining knowledge of the real world. (Houghton, 2011).

A quantitative method such as a survey/questionnaire will be used to collect essential data using a mano-method technique and cross-sectional research design study for the data collection and analysis. The outcome will then be examined for confirmation or rejection of the theory. (BRM, 2023).

3.2. Research Approach

The research paradigm ontology will be objectivism with epistemology positivism. A quantitative methodology approach of structured questions to gather data. This method collects numerical data, measures variables, and verifies existing themes. The data analysis will be deductive to compare groups and establish a structure. Finally, the data will generate a new hypothesis based on the results of the information collected about different variables. (The Study Space, 2023.)

Alternatively, two variables are used to establish a theme and see if the two correlate. (Carpenter, 2018).

This methodology approach was chosen for many reasons, data from the survey will be used in a descriptive observation research method of descriptive statistics and numbers. In addition, cross-sectional studies describe variables, not measure them; this way, many characteristics can be looked at once. (Simkus, 2021).

Information will be collected via an online questionnaire in a quantitative method to explain the chosen phenomenon. For example, to understand phenomenology, A quantitative methodology approach will be conducted from a quantitative research method as it is a Positivist epistemology. A scientific research method is a view of the world and the facts to make a legitimate claim. The data collection will be based on statistics and how many partakers will participate. This positivist approach means the Research will move through a deductive hypothesis as the data is examined objectively. (Brown, 2021).

Data will be collected via an online questionnaire uploaded to two popular social media platforms, Facebook and Instagram, to capture many part-takers.

The information collected will be analysed by statistics which will provide reliable results because quantitative data is related to numbers and is a phenomenon system that gathers information from a wide range of opinions to gather fair results using a probability sampling method. Four methods can be used to collect quantitative data: Interviews, data collection, observation of existing records and questionnaires. (Bhat, 2023).

Using quantitative data will look for objective opinions on a particular problem or Research. Quantitative data will provide a viewing of consumer behaviour and how people know and understand where we get our fresh produce, how much we waste of that amount, and if we believe we can be self-sustainable as a country.

Computer manners, statistics, or maths can then analyse the data. (QuestionPro).

The advantage of quantitative data is that the approach is considered a scientific objective and rationale. It is valuable testing and validation for already constructed theories. It is a fast analysis process. It is less open to ambiguities of interpretation, unlike a qualitative approach. The data hypothesis can also be tested because of statistical analysis. (McLeod, 2019).

The quantitative research method enables the ability to gather many responses, allowing the data to be analysed statistically instead of inputting the data manually when using a qualitative methodology. Positivists prefer the quantitative method because of its reliable results, structured questions and positivism. Social Research establishes relationships between society and an individual. The general focus of the research study is uncovering human behaviour to select the suited research method. (Thompson, 2015).

To describe the phenomenon, a descriptive observant research method will be used to identify descriptive characteristics from the partaker's views and will be displayed based on the statistics and numbers. The research design aims to gather the information to describe a phenomenon or situation.

According to an online article, Simply Psychology (2021), statistics can be descriptive or inferential, which helps to turn quantitative data into information that can help with decisions that need to be made. Data is used to summarise and describe patterns, themes, and relationships. Descriptive statistics help summarise the data, whereas inferential statistics identify statistically significant differences between data groups. Critical features of quantitative Research are its aims for objectivity and either used to support a theory or reject it. (McLeod, 2019).

The questionnaire is created to gain information to Investigate if we as a nation know how much we rely on other countries for fresh produce and how much we waste of that amount. The study's ontology will analyse Consumer behaviour and the patterns and adaptations we can make to benefit the planet in more ways than one.

3.3. Research Strategies

Build a research plan and target the age group of 18-64 with ten nominal and non-nominal questions.

Quantitative data is about divergent thinking, finding a solution to a problem, and establishing data collection methods by planning how to analyse the data resulting in a conclusion. (Bhat, 2023).

The positives of quantitative data are that statistics cannot be argued against, with it being a large sample of a wide range of demographic people. Quantitative data is measured by numbers and collected by measuring variables. (Mills, 2021). Data will be explained in variables of quantities, i.e., gender and age. (OECD, n.d.).

A cross tab analysis will analyse patterns and understand relationships between two or more variables, and categorical data collect demographics that cannot belong to more than one category. (Aprameya, 2016).

Descriptive data draws information. Inferential identifies a significant difference between data groups. Finally, quantitative questions are usually created with a structured approach. (Stevens, 2021).

The questionnaire was created from Microsoft forms, a cloud-based software enabling partakers to take part anywhere in their own time without influence or manipulation. The questionnaire will be Saved on the OneDrive system and uploaded to social media. The SPSS Software (Statistical Package for Social Statistics Change) and Excel will process the data, establish results, and identify patterns. All partakers will be assigned an ID to ensure ethics are followed and their data is protected and anonymous. Results are imputed into SPSS. Data will be scanned to ensure there are no errors in the findings. A coding frame will be used, and labels that correlate with the multiple-choice questions will be given. Variables will be entered and made either nominal scale or ordinal. Nominal (named variables) categorise data into groups, and ordinal (named and ordered variables) measure variables by ratings, providing insight into attitudes and behaviours by understanding the responses. (Baht, 2023).

3.4. Procedure and Sampling

According to Survey Monkey (2023), determining a sample size will depend on the target audience and a well-designed survey for the results to represent the point. (Graglia, 2023). According to Chief Community Engagement Officer for Explorance Yeona Jang, the survey's reliabilities and validity are vital elements to consider when creating a survey. A survey can provide reliable data as large amounts of opinions are collected. However, questions should be clear and understandable to establish appropriate conclusions from the results. There are good and bad surveys; Bad surveys provide poor results; however, a good survey offers an accurate decision for a conclusion. (Jang, 2020).

The questions will be closed, nominal, and ordinal. Nominal questions, such as gender and age. Ordinal questions, such as how they would feel. The questionnaire was created containing ten questions with the aim of 100 respondents. According to an online organisation, a minimum of one hundred people should participate in gathering meaningful results. (Bullen, 2022).

The first two questions were gathering demographic information, gender, and age. Afterwards, themes will be grouped in analysis with a multiple-response method and multiple-choice responses, including yes or no questions.

Ethical Considerations

An online article by The Study Space (2023) stated that questions should be straightforward, not confusing, and used in a responsible way to collect and manage the data by coding questionnaires, gaining permission via an ethics form to publish the survey, and ensuring all partakers' information will be kept confidential. A statement was stated on the questionnaire for the participants, and each partaker gave consent by agreeing to take part. In addition, they decided to the following:

- To understand, their participation in the survey is voluntary, and they may wish to withdraw at any time.
- Their identity is not linked to their data, and their information is confidential.

3.5. Questionnaire Design

QUESTIONS	QUESTION TYPE	REASON FOR QUESTION
1. What is your gender?	Closed	Understand a range of opinions by gender
2. What is your age?	Closed	Understand if opinions change with age
3. Are you aware of where the food you consume comes from.	Closed	Demonstrate an understanding of education and knowledge on this subject.
4. Do you think we are aware as a nation of how much we rely on other countries for fresh produce?	Closed	Gain an understanding if people are aware of where their food comes from.
5. Do you overbuy and end up wasting food?	Closed	Gain an understanding of consumer behaviour and overbuying.
6. Are you aware we as a nation waste half of the produce imported to us?	Closed	Gain an understanding of consumer behaviour and waste.
7. Do you think it's important for a country to be self-sustainable without the need of foreign fresh imports?	Closed	Can self-sustainability be possible?
8. Do you believe that self-sustainability is possible?	Closed	Gain an understanding if we are confident or not as a nation.
9. Would you be interested in growing your own produce after learning how much we rely on other countries?	Closed	If there is an interest in producing your own produce after gaining knowledge on how much reliance there is on imports for fresh produce.
10. How educational was this survey?	Closed	Did you learn anything from this survey? Is a lack of education and awareness the problem?

Figure 3: Research Questions.

3.6. Timeline

Cross-sectional Research is more suitable for the study as it allows large amounts of data to be collected from a population at a specific moment. In contrast, longitudinal study data is repeatedly collected from the same sample over some time. (Scribbr, 2023).

Longitudinal Research Design would not have been suitable for the time frame of this study.

3.7. Limitations

The Limitations of a quantitative research method can mean the participants who take part represent the targeted population. Other weaknesses include its structured questions, limited response options and close-ended questions providing little outcome and feedback. In addition, the analysis procedure can be time-consuming. (Chetty, 2016).

Other weaknesses are:

- A large sample is needed.
- The Research is not taken place in a natural setting.
- Opinions are not explained.
- Questionnaires can provide a lack of information which could negatively affect statistics. (Mcloed, 2019).

Social media can also have limitations in collecting responses from only gathering data from active people with a social media account, potentially missing out on the views of business owners, farmers, and older people.

3.8. Methodology Overview

Saunders's Research Onion has been used as a guide in this chapter to establish what research methods would be more suited to gather data for the analysis. A questionnaire will provide a sample of part of the population's opinions of how much we import as a nation and how much we waste. A quantitative research framework is a reliable data collection method in social sciences to study social, economic and behaviour patterns.

Chapter 4 - Data and Findings

This section introduces the primary research data using mathematics and testing. Primary research data is not found anywhere else: it is data collected first-hand. (Driscoll, 2011).

100 responses were gathered from the online questionnaire. The random sampling method achieved the results from a random selection of participants from the population. A popular data collection method in research. (Taylor, 2023).

The data sample can be considered reliable as a minimum of 100 responses are required for meaningful results. (Fox, 2022).

Question 1.

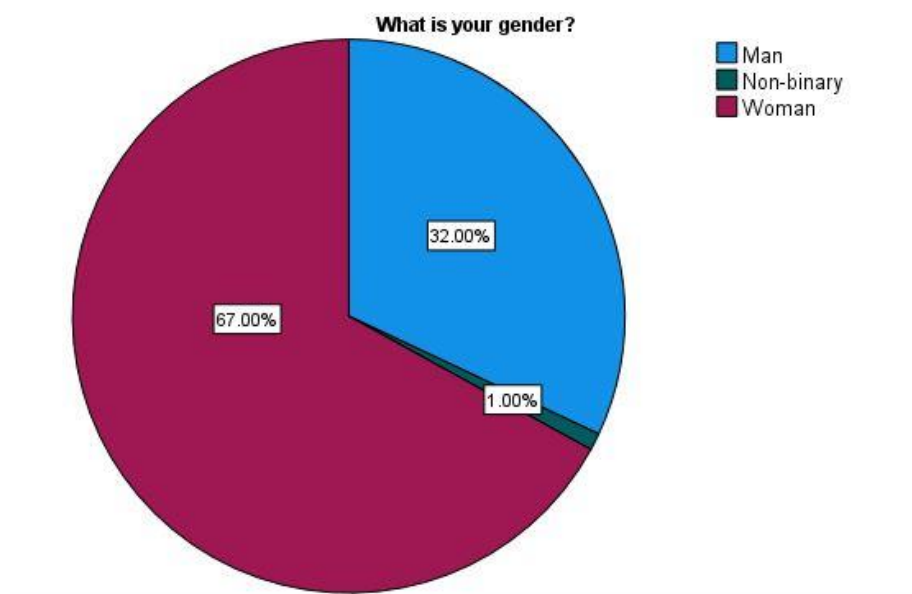


Figure 4: Participants Gender.

Figure 4 identifies a broad demographic age group participating in the online questionnaire. 67, 32 men and 1 non-binary person participated in the questionnaire. The majority of participants were women. Analysis was undertaken on this question to establish if behaviours change by age.

Question 2.

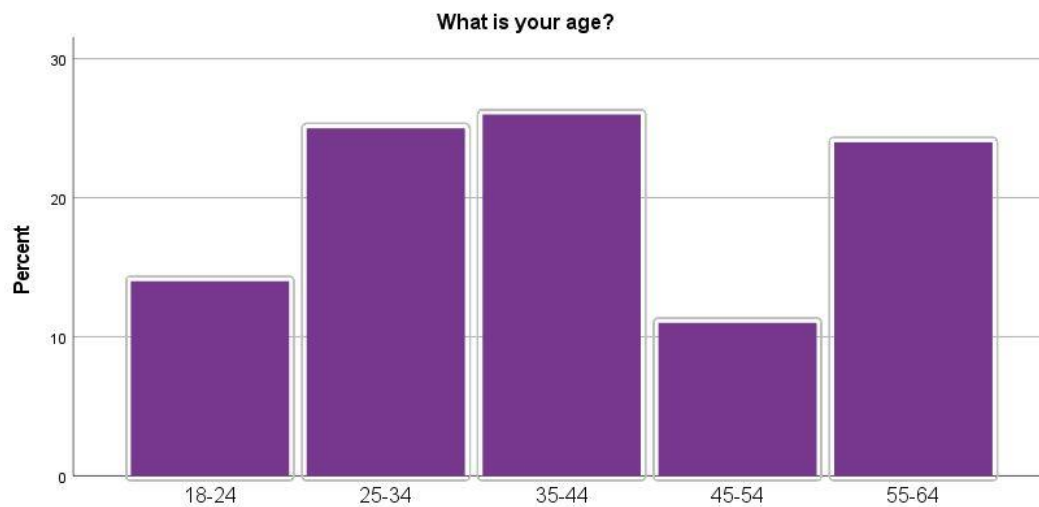


Figure 5: Age of Participants.

Figure 5 shows age groups of participants:

- 14 people aged between 18-24.
- 25 people aged between 25-34.
- 26 people aged between 35-44.
- 11 people aged between 45-54.
- 24 people aged between 55-64.
-

Question 3.

Are you aware of where the food you consume comes from?

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	Maybe	36	36.0	36.0	36.0
	No	33	33.0	33.0	69.0
	Yes	31	31.0	31.0	100.0
	Total	100	100.0	100.0	

Figure 6: Awareness of Consumption.

- 33 people are not aware of where their food comes from
- 31 are aware of what they are consuming.
- 36 people had an idea and answered maybe.

Question 4.

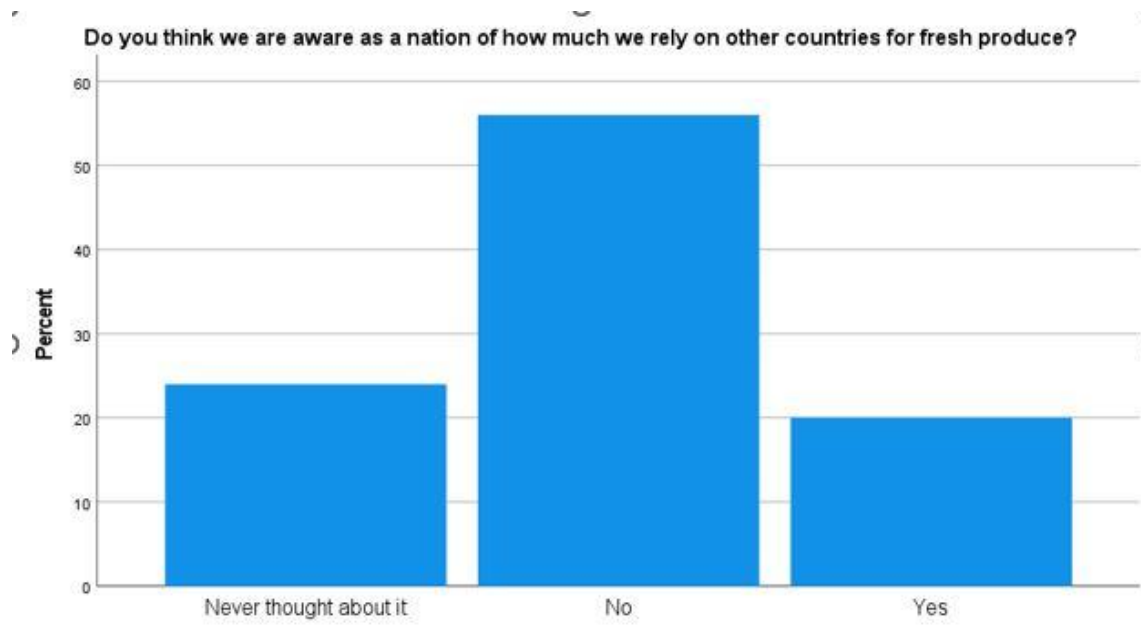


Figure 7: Awareness of Reliance.

56 people don't think we are aware, 24 people have never thought about it, and only 21 out of 100 people are aware. This result could be a topic for future research.

Question 5.

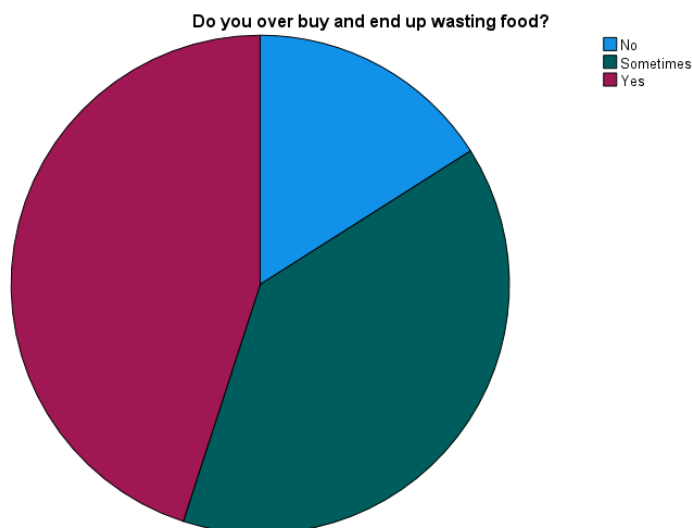


Figure 8: Investigate Consumer Behaviour and Waste.

45 participants overbuy and waste, 39 participants sometimes waste, and only the remaining 16 participants do not overbuy and waste food. This could provide a topic for future research.

Question 6.

Are you aware we as a nation waste half of the produce imported to us?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	59	59.0	59.0	59.0
	Yes	41	41.0	41.0	100.0
	Total	100	100.0	100.0	

Figure 9: Establish Awareness of Wasted Imported Produce.

41 participants were aware, but 59 participants were not aware we as a nation waste half of the produce imported to us, suggesting a lack of knowledge.

Question 7.

Do you think it's important for a country to be self sustainable without the need of foreign fresh imports?

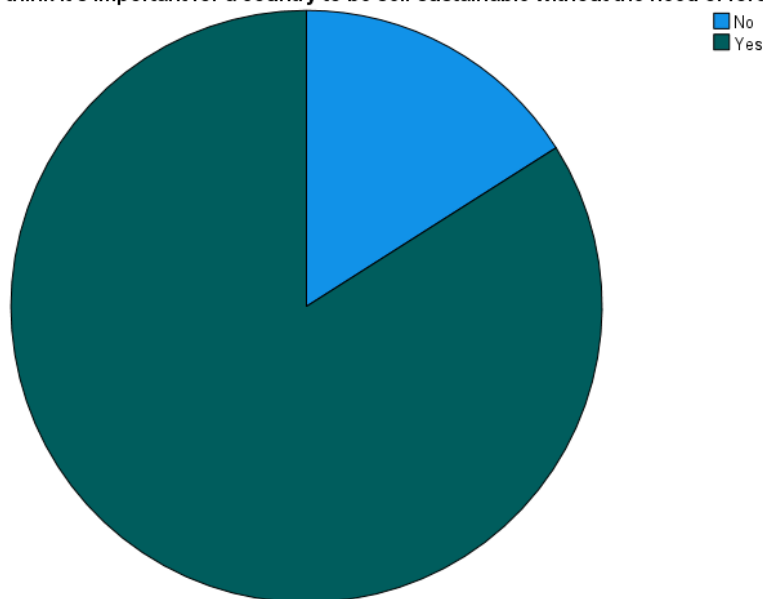


Figure 10: Investigate Consumer Attitude Towards Self-Sustainability.

84 participants agreed that a country must be self-sustainable, with 16 suggesting against it.

Question 8.

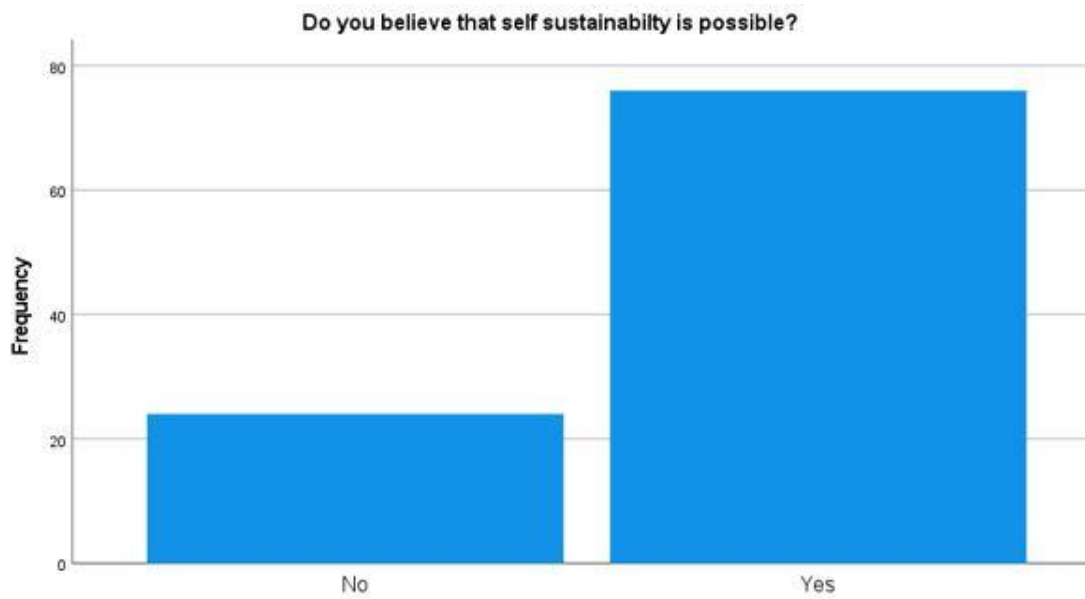


Figure 11: Gather Awareness of Confidence for Change.

76 participants believe self-sustainability is possible. However, 24 stated they don't think It can be.

Question 9.

Would you be interested in growing your own produce after learning how much we rely on other countries?

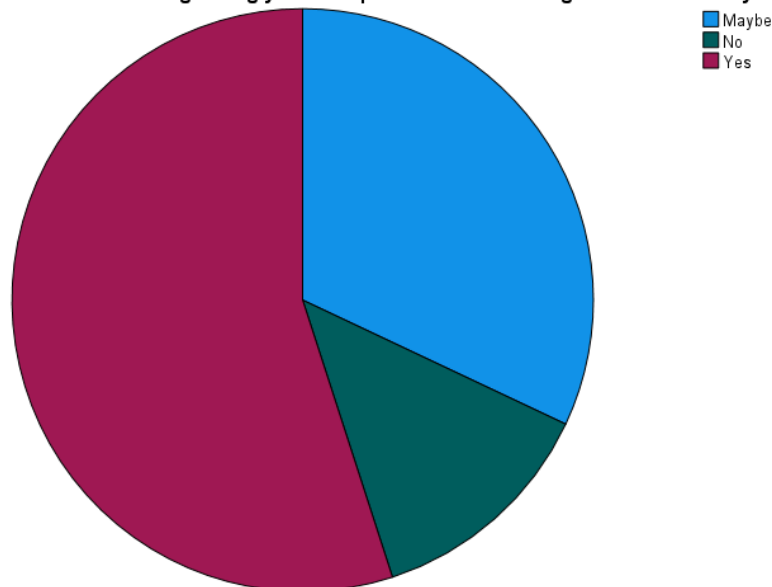


Figure 12: Are People Interested in Growing Their Own Produce.

55 people would be interested in growing their produce after learning how much we rely on other countries. 32 people stated maybe, with the remaining 13 expressing no.

Question 10.

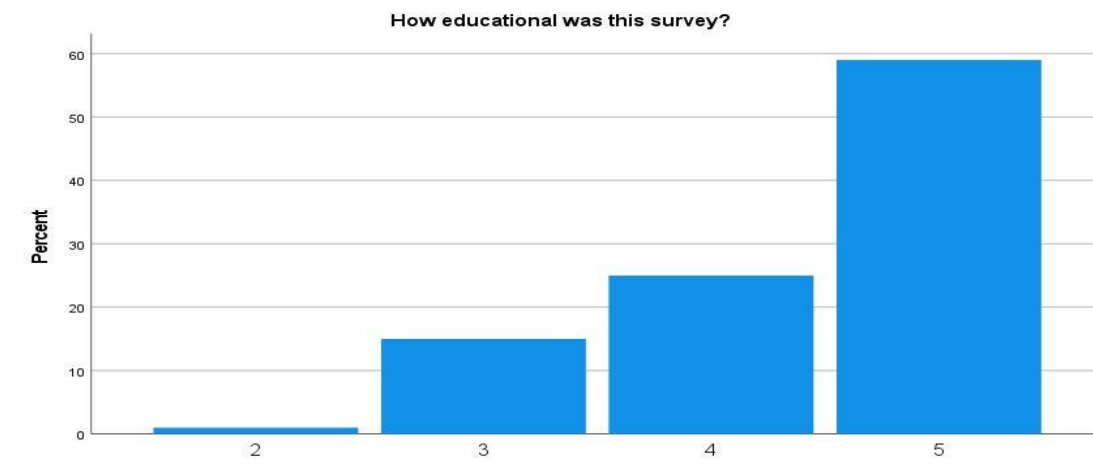


Figure 13: Is There a Need for More Education on These Topics.

Figure 13 scores on a scale of 1-5.

- 59 people rated the survey for education - 5 stars.
- 25 people - 4 stars.
- 15 people - 3 stars.
- 1 person rated the survey - 2 stars.

Over half thought the survey was educational, stating there needs to be more education on the above-mentioned topics in the literature review.

4.1 - Data and Findings overview

Below are bullet points from the main findings:

- The majority were women who participated in the questionnaire.
- Age group - 35-44 participated the most.
- Only 31/100 participants know where the food they consume comes from.
- Only 20/100 participants know that we as a nation rely on other countries for fresh produce.
- Only 16/100 participants do not overbuy and waste food.
- 59 people are not aware we waste half of the produce imported.
- 84/100 participants believe we can be self-sustainable without the need for fresh imports.
- 87 out of 100 would be open to the idea or interested in growing their produce.
- 84/100 participants also rated the survey 4-5/5 regarding its education.

Chapter 5: Analysis

Above, the methodology explained the approach used and the closed-ended questions which will be used to provide the information needed. The data was evaluated using the IBM SPSS Software to establish a correlation and establish relationships between numerical data only. When both variables are tested, quantitative correlation measures the strength of the relationship. The correlation formula is Pearson and spearman. (Turney, 2022).

Pearson correlation, also known as bivariate correlation or the correlation coefficient, is a descriptive statistic measuring the linear correlation, The strength and direction of a relationship between two quantitative variables. The connection is measured by numbers -1 and 1; when one variable changes, the other changes in the same direction. (Turney, 2022). The spearman correlations coefficient is based on ranked values for each variable rather than raw data. (IBM, 2021).

The correlation coefficient is a numerical measure that assesses a linear relationship strength. (UF Biostatistics, 2023).

5.1. Cross tabulations.

Cross tabs will quantitatively establish a correlation between multiple variables. (Aprameya, 2016).

Question 1 & 2.

**What is your age?
* What is your gender?
Crosstabulation**

Count		What is your gender?			Total
		Man	Non-binary	Woman	
What is your age?	18-24	6	1	7	14
	25-34	5	0	20	25
	35-44	11	0	15	26
	45-54	1	0	10	11
	55-64	9	0	15	24
Total		32	1	67	100

Figure 14: Age & Gender.

67 women, 32 men and 1 nonbinary took part in the questionnaire. Below will establish if age and gender correlate with other categories.

Question 1 & 5.

		What is your gender? * Do you over buy and end up wasting food? Crosstabulation					
Count		Do you over buy and end up wasting food?					
		No	sometimes	Sometimes	Yes	Total	
What is your gender?	Man	8	0	10	14	32	
	Non-binary	1	0	0	0	1	
	Woman	7	2	27	31	67	
Total		16	2	37	45	100	

Figure 15: Gender – Overbuying and Waste.

31% of women admitted to overbuying and wasting food, with 29% stating they sometimes waste food, establishing a significant hypothesis, with 60% of women overbuying and wasting products. However more women took part in the survey resulting in a null hypothesis.

Question 2 & 5.

		What is your age? * Do you over buy and end up wasting food? Crosstabulation					
Count		Do you over buy and end up wasting food?					
		No	sometimes	Sometimes	Yes	Total	
What is your age?	18-24	3	0	6	5	14	
	25-34	2	1	5	17	25	
	35-44	2	0	10	14	26	
	45-54	3	0	5	3	11	
	55-64	6	1	11	6	24	
Total		16	2	37	45	100	

Figure 16: Age – Overbuying and Waste.

The above shows that 45% of people waste food, with 17% being the highest in the 25-34 age group, establishing there could be a significant relationship regarding age being a waste

factor. However, only 6% aged 25-34 sometimes overbuy and waste. Yet 10% of 35–44 age group sometimes overbuy and waste, and 14% admit to over-buying and wasting, totalling 24% out of 25% of the age group 35-44, the highest mark in this category.

However, despite the above, 39% of people sometimes overbuy and waste, and 12% of that figure are 55–64 years old, yet 6% of that age group do not waste, resulting in the age group 55-64 being highest response in this category for sometimes wasting food yet the lowest result for the age group regarding not over buying or producing waste. Establishing there is no relationship between age and waste.

Question 2 & 3.

		What is your age?			* Are you aware of where the food you consume comes from?	
		Crosstabulation				
Count		Are you aware of where the food you consume comes from?				
		Maybe	No	Yes	Total	
What is your age?	18-24	3	7	4	14	
	25-34	7	11	7	25	
	35-44	8	10	8	26	
	45-54	7	2	2	11	
	55-64	11	3	10	24	
Total		36	33	31	100	

Figure 17: Age – Awareness of Food.

The above demonstrates that older people aged 55-64 are aware or have an idea of where the food they consume comes from. However, 33% of people are unaware, with 28% of that amount stated from 18-44-year-olds.

Question 2 & 10.

		What is your age?				* How educational was this survey?	
		Crosstabulation					
Count		How educational was this survey?					
		2	3	4	5	Total	
What is your age?	18-24	0	1	3	10	14	
	25-34	0	1	8	16	25	
	35-44	1	5	9	11	26	
	45-54	0	5	0	6	11	
	55-64	0	3	5	16	24	
Total		1	15	25	59	100	

Figure 18: Age- Feedback on Survey.

37% of people in the age group 18-44 scored the survey 5 stars, with 20% from the same age group also scoring 4 stars. These figures have established that for people under 44 years old, 57% out of 65% (over half) stated the survey was educational with a rating of 4 or 5 stars.

Question 2 & 6.

		What is your age?		
		* Are you aware we as a nation waste half of the produce imported to us?		
		Crosstabulation		
Count		Are you aware we as a nation waste half of the produce imported to us?		
		No	Yes	Total
What is your age?	18-24	10	4	14
	25-34	14	11	25
	35-44	17	9	26
	45-54	6	5	11
	55-64	12	12	24
Total		59	41	100

Figure 19: Age – Awareness of Waste and Imports.

59% of people who participated stated they are unaware that we as a nation waste half of the produce imported to us. Although again, results show 41% out of the 59% are 18–44-year-olds.

Evaluating questions 2 & 3, 2 & 10 & 2 & 6, I believe there is a significant hypothesis that the younger generations (under 44 yrs.) need more education on the above topics. This could provide a topic for further research.

Question 2 & 7.

		What is your age?		
		* Do you think it's important for a country to be self sustainable without the need of foreign fresh imports?		
		Crosstabulation		
Count		Do you think it's important for a country to be self sustainable without the need of foreign fresh imports?		
		No	Yes	Total
What is your age?	18-24	2	12	14
	25-34	6	19	25
	35-44	5	21	26
	45-54	1	10	11
	55-64	2	22	24
Total		16	84	100

Figure 20: Age – Sustainability.

84% stated that a country must be self-sustainable. Establishing a significant relationship regarding support for change.

Question 2 & 9.

What is your age? * Would you be interested in growing your own produce after learning how much we rely on other countries? Crosstabulation					
Count		Would you be interested in growing your own produce after learning how much we rely on other countries?			
		Maybe	No	Yes	Total
What is your age?	18-24	2	1	11	14
	25-34	11	1	13	25
	35-44	7	5	14	26
	45-54	2	4	5	11
	55-64	10	2	12	24
Total		32	13	55	100

Figure 21: Age – Interest in Growing Your Own.

55% of all people aged between 18-64 would be interested in growing their own after learning how much we as a nation rely on other countries for fresh produce, with 32% saying maybe. Although a total of 87% stated interest. 24% of 25–34-year-olds expressed the highest interest.

Question 1 & 9.

What is your gender? * Would you be interested in growing your own produce after learning how much we rely on other countries? Crosstabulation					
Count		Would you be interested in growing your own produce after learning how much we rely on other countries?			
		Maybe	No	Yes	Total
What is your gender?	Man	12	6	14	32
	Non-binary	0	0	1	1
	Woman	20	7	40	67
Total		32	13	55	100

Figure 22: Gender - Interest in Growing Your Own.

Looking at both previous cross tabs, of the 55% of people stating interest, 40% of the 55% were women displaying a significant correlation between women and the appeal to develop their own produce. However more women participated in survey deeming this analysis as invalid.

Chapter 6: Discussion

Are we aware as a nation of how much we rely on other countries for fresh produce?

The research aimed to establish if any relationships exist between the literature and data findings. Looking at the literature review, figures in the U.K. have remained the same. Every year 9.5 million tonnes of food is wasted, with 60% coming from homes.

Although people waste food, the findings showed that the majority of the 100 participants believe a country should be self-sustainable yet are unaware of where their food comes from, the reliance on imports and what is wasted. The findings also reflect consumer attitudes and behaviour patterns; the literature review demonstrates that public education campaigns do influence consumer behaviours showing people are influenced by their surroundings; however, is this enough of an influence? Does this provide enough knowledge to consumers?

Education and a lack of knowledge have proved to be part of the issue, and if there were more awareness out there on climate change, waste, imports, poverty, and the state of the planet, maybe a change would then happen.

The cross-tabulation tests on the close-ended questions' data show statistically significant differences. These results from the data will be discussed in further detail concerning the literature review findings and following the research questions. Therefore, this chapter investigates the fourth objective:

Evaluate education by comparing ages and knowledge, establish if people's shopping behaviours can change towards becoming self-sustainable by growing produce and buying less, resulting in less waste, a healthier planet and society. Suppose a sustainable business or organisation would beneficially impact everyone and everything by offering the education, knowledge and equipment to grow your own.

6:1: Research questions

The findings reflect the literature review regarding the amount of waste disposed of in the U.K per year. Out of 100 people, 60 people overbuy and waste food showing that over half of the participants who have taken the survey overbuy and waste. This states the literature review and the data collection match. Consumer behaviour and the data displaying the lack of knowledge also matched the literature review. Growing your own can be influenced to benefit lives as it had many centuries ago.

Age, Gender, and Waste

The results from the data show that women overbuy and waste food. However, more women than other genders participated in the questionnaire resulting in a null hypothesis: no statistical relationship exists in this survey between both gender and waste. 67% of participants were women who took part, 29% sometimes wasted, and 31% admitted overbuying and wasting produce. 60% contribute to waste, with the remaining 7% not. 60% were women who would maybe grow their own produce after establishing the nation's reliance on fresh imports.

58% of participants aged 18-44 stated they waste produce, saying that the majority of participants who took part total the most at this particular time taking the questionnaire proved to be female and aged between 18-44.

Also, according to an online article, 18–34-year-olds waste more food than other ages students being the majority in this group. (What Age Wastes the Most Food, n.d.).

Age and Knowledge

33% of all ages stated they don't know where their food comes from, and 28% are aged between 18-44. Furthermore, 59% are unaware that we waste half of the imported goods, with 41% between the ages of 18-44. Importance for a country to be self-sustainable 84% said yes, with 52% of that figure aged between 18-44.

37% out of 58% from the same age group - 18-44, rated the questionnaire five stars for education. Do they state a relationship between a lack of knowledge in those under 44?

Age, Gender and Growing Your Own

55% of participants would be interested in growing their own produce. 38% out of the 55% were aged between 18-44, and 14% of 38% of being participants aged between 35-44. 32 participants stated maybe, with the highest amount coming from 25–34-year-olds at 11%. 40% out of 55% were women who stated they would grow their own produce, with 20% of women also expressing maybe. 60% out of 87% of participants were women who said they would/may be interested in growing their own produce. Again 60% out of the 67% of participants were women.

Even though women were the majority to take part in the questionnaire, a fair or unfair analysis of defining whether gender can relate to the questions asked and whether the data

can be relied upon. 67% of women, 1% non-binary and 32% of men. Stating there was half the number of men who participated. However, age seems to have a strong relationship and correlates with the questions asked. For example, participants aged between 18-44 were the most to show up with a lack of knowledge on waste and where their food comes from, alongside stating the questionnaire as five stars for education. However, what is extraordinary is that the age group 18-44 contribute the most waste; however, the same age group 18-44 data showed this age group showed the highest result with confidence stating the importance of a country being self-sustainable.

6.2. Recommendations and Future Research Subjects

- Increase education regarding imported food, climate change and sustainable living.

Future research subjects gather information from education industries to establish if there is a lack of knowledge on Climate Change and Sustainable Living.

According to an online article by The Guardian (2022), there is a belief that there is a lack of education for Britain school children regarding education on climate change, with the subject often being missed from the curriculum. However, a spokesperson for the education department stated that by 2023, all teachers would have access to high-quality curriculum resources with support to enable teachers to teach climate change. (Harvey, 2022).

However, in 2018, according to a google book published by UNESCO (2018), The United Nations Educational, Scientific and Cultural Organization created an education sector for sustainable living to educate about the planet's environmental challenges. Their objective is to achieve long-term sustainable development by providing individuals with the knowledge, attitude, and skills to achieve critical and systematic thinking methods, decision-making, and awareness of their carbon footprint regarding local and global issues. Furthermore, the Organization encourages and supports these topics in the curriculum. (Leicht, et, al., 2018).

Yet, an article by conservative Post (2021) stated in 2023, climate change will become introduced into the science curriculum. (Hallowell, 2021).

The subject was promoted in education a few years later, and its effects are only now happening, and then, are they? According to U.K. Parliament (2023), the Secretary of State for Education, Nick Gibb, was asked if the subject 'Climate Change' will be introduced sooner as a new law for the issue to be taught throughout primary and secondary schools. The request was rejected, stating it features as part of Science and Geography throughout schools. However, a level in environmental science is possible with a natural history a-level available to achieve in 2025 and onwards. (U.K. Parliament, 2023).

Time will tell if there will be more education and awareness on this topic.

- Are women the worst at wasting food and overbuying?

From the data above stating more women took part in the survey, it would be an unfair analysis to assume this is the case; however, this would make an interesting topic for future research because, according to an online article by Radical Statistics, results from a survey by the office of national statistics in the U.K. said women spend more time shopping than men. Results also showed that women buy large amounts of small household items, whereas men rarely purchase. (Hewson, n.d.).

- Grow your own.

As stated in an article by Wales Online (2021), People are interested in growing their own food these days. Lockdowns and threats to the supply chain have encouraged others to produce their own fruit and vegetables. Nearly three-quarters of 18-24-year-olds grow crops or plants, with 23% stating they use windowsills and 20% who live in urban areas saying they use their bedrooms. The Jeremy Clarkson's Farm documentary has sparked interest from viewers stating that 35% want to start growing at home, 27% want to educate their children, and 33% of people want to grow to become healthier. However, research from Samsung electronics U.K. and Ireland showed that 38% of British people are put off growing their own produce due to a lack of knowledge. (Wales Online, 2021).

It is evident to see how advanced technology has become; scientific technologies have improved by how growing techniques have advanced, using glass houses (greenhouses) and artificial fertiliser. (Edwards, 2019). Anything is possible, and to back this claim, according to an article by the Independent (2016), an environment editor stated that exotic fruits can now be grown in Britain due to the temperature change. Growing seasons are extended, meaning fruits such as strawberries are flourishing. Bawden, 2016).

In 2021, Wales Online also stated that growing exotic fruits at home is possible, with Experts from Garden Buildings Direct commenting that growing produce at home can positively impact the environment, reduce plastic packaging, and reduce carbon footprints. Many fruits can quickly and efficiently evolve from the comforts of your home, such as pineapples; they can be regrown from the spike of a pineapple, similar to a dragon fruit that can be regrown from its own seeds but takes time to harvest (around one to two years). Growing Mango is easier to grow from seed and fruits in three months. Pomegranate and apricots are possible to grow with the hotter climate; yet, if the harvest is successful, the fruit will grow within three weeks. (Shaw, 2021).

No space is too small to grow; with light and care, anything can be developed. (Wales Online, 2021).

7. Conclusion

If my hypothesis is correct, there's a lack of education on imported food, waste and climate change. However, there is a high interest in growing produce after the survey's information. Also, as stated in the literature review, growing fruit and vegetables has proved beneficial towards positive mental health, the increase in the cost of living, poverty and providing a healthy quality of life. Growing fruit and vegetables locally will reduce the need for fruit and vegetable waxing which enables the produce to last longer during importation. In addition, growing your own produce will allow individuals to control the food they consume, regulate the pesticides they use on the fresh produce and, most of all, manage their contribution to waste. It can also be beneficial for the planet long term with less need for imports and transportation, no plastic for packaging, less waste ending up in landfill releasing methane gases and most of all, the security for individuals to be able to provide for themselves and the local communities during any potential future crisis.

Fresh produce shouldn't be premium prices, categorising people by their incomes; it should be fair for everyone to be entitled to all the greatness of the world's food. To achieve this, growing your own produce (Growing locally a large number of crops to dismiss premium prices) would be the way forward. For example, some food must be grown abroad due to weather conditions and the temperature needed for exotic fruits. However, there could be a change regarding science and weather temperatures. Heat technologies could potentially solve the problem resulting in less of a need to import exotic fruits.

As shown above and below in the appendix, growing produce is possible to do. A pack of seeds costs little money and can last for many harvests helping to reduce poverty, improve the climate, and positively affect health, possibly releasing pressure off the NHS in the long run. It is also a safety net regarding the cost of living, with the cost of growing your own cheaper in the long run than purchasing from the supermarket. Although growing fruit and vegetables contribute to global warming, new technologies and sustainable farming techniques can reduce emissions. Many changes have happened since the industrial revolution proving that anything can be possible. Why not try and improve the planet in any way you can?

Also stated below in the appendix, growing produce can be achieved, even with a sustainable kit. No plastics are needed resulting in an eco-friendly growing system.

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Chapter 9: Appendix

9.1. Appendix 1.

Grow your own produce - steps to a greener, healthier planet for the future. Below are examples of how quickly Italian flavours such as herbs, tomatoes and peppers can grow. I have developed these as an experiment using an eco-friendly growing kit made from cardboard and recyclable plastics. This kit is sold by 'pronto seed' and cost me at the time £3 and was purchased from amazon. Prices do vary.

Below demonstrates the start process, germination and growth stages of California Wonder Bell Peppers, Money-maker Tomatoes, White Lisbon Spring Onion, Sweet Genovese Basil, and Cilantro Coriander.

20th December 2022



Figure 23: Pronto Seed Eco-Kit



Figure 24: Planting Cells



Figure 25: Indoor Sowing

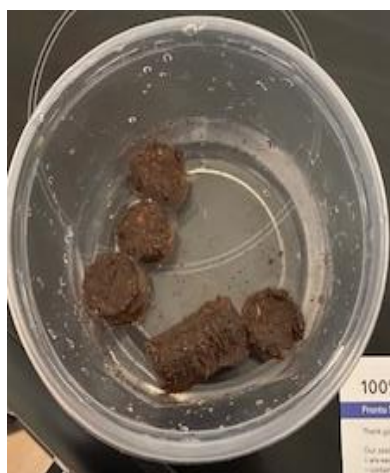


Figure 26: Coir Disks & Water



Figure 27: Ready for Indoor Sowing



Figure 28: Seed Planted in Cells

31st December 2022



Figure 29: Growth Stage 1

7th January 2023



Figure 30: Growth Stage 2

11 days after planting 2 cells have started to sprout. (Germinate). 18 days later 8 cells had begun to germinate.

24th January 2023



Figure 31: Growth Stage 3

35 days later sprouting took shape and will be ready to re-potted into bigger pots.

13th March 2023



Figure 32: Re-Potting-Bigger Pots.



Figure33: Basil Cell.



Figure34: Replanted- Peat Free Compost.



Figure 35: Basil



Figure 36: Spring Onion



Figure 37: Bell Pepper



Figure 38: Coriander



Figure 39: Tomato Plant



Figure 40: Place of Growth and Growth Stage 4. 26th March 2023

