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# Sustainability and Consumer Education on Food Sustainability

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A postgraduate thesis submitted in accordance with the requirements for the degree of Master  
of Research in Food Science

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## DECLARATION

I Itumeleng Thandile Moeti, declare that this research work titled ‘Food Sustainability and Consumer Education on Sustainability’ was carried out by me under the supervision of Dr. Delia Ojinnaka (Director of Study) of the School of Applied Sciences (Division of Food Sciences), London South Bank University, London, United Kingdom.

I declare that the work submitted is my own. The findings from the survey have not been submitted to any University for examination or award of degree. Appropriate credit has been given where reference has been made to the work of others. All sources used or quoted have been acknowledged by means of complete references.

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## **ABBREVIATIONS AND ACRONYMS**

**BEUC** – The European Consumer Organisation (Bureau Européen des Unions de Consommateurs)

**CSR** - Corporate Social Responsibility

**D&D** – Decarbonise & Decolonise

**EfS** – Education for Sustainability

**FSSA** – Food sustainability and Sustainability Awareness survey

**GHG** - Greenhouse gases

**KTCF** - Kentish Town City Farm

**LFHW** - Love Food Hate Waste

**PAA** - Policy action agenda for transition to sustainable food and agriculture

**SDG's** - Sustainable Development Goals

**WRAP** – Waste Resource and Action Program

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## ABSTRACT

In order to minimise food waste, there needs to be significant change at all stages of food production and consumption. Household food waste makes up 70% of all food waste in the UK. 65% of this food waste is avoidable, but significant changes in consumer shopping and household food management behaviours are necessary. Whilst consumer awareness of sustainability is rising, it does not always translate into action by consumers to implement sustainable practices in their lives. The food sustainability and sustainability awareness survey found that consumers are eager to live more sustainably, however lack of education and a disconnect between their actions and behaviour inhibits sustainable practice. Consumers need to learn how to approach sustainability holistically and understand the connection between their daily actions and climate change. Personal, social and financial barriers each contribute to how individuals approach sustainability, financial barriers being the biggest barrier to green consumerism. The majority of consumers feel a responsibility to be more sustainable, however they also believe the weight of the environmental crisis and sourcing solutions should be placed on the food production sector and governments. The survey also revealed that there is an interest in educational resources on managing household food waste, food sustainability and climate change. Informal education avenues such as educating on food sustainability online or on urban farms show promise. Urban farms and community gardens provide idyllic spaces to educate on food sustainability, along with feeding local communities, creating employment and fostering community spirit.

Keywords: food sustainability; education for sustainability; food waste; sustainability awareness; sustainable practice

## CHAPTER 1: INTRODUCTION

### 1.1 Overview

At present, sustainability is in the public eye more than it has ever been. In recent years, climate change has shifted from being associated with environmental organisations, to being in the forefront of mainstream media. The heavily publicised environmental degradation and increasing rate of global warming have resulted in a growing awareness of environmental issues amongst consumers (Sanchez-Sabate, 2019). Within the current social media landscape, it grows harder to feign ignorance, as climate change has officially entered the mainstream. Corporate Social Responsibility (CSR) has gained momentum, with companies now expected to take initiative and provide solutions for environmental issues (de Freitas Netto et al., 2020). Aside from fossil fuels and industrial developments, agriculture is one of the largest contributors to climate change (FAO, 2018). The climate crisis and extreme changes in weather directly affect global food supply. Its negative effects impact a multitude of food production processes, which in turn impacts food availability and accessibility (SDG2 Advocacy Hub, 2018). Factors such as deteriorating water supplies, soil degradation and air pollution impact crop quality and yields. In order to combat and anticipate changes, the food system needs to be adaptive and reactive (SDG2 Advocacy Hub, 2018). To achieve this, the current food system requires momentous change that cannot be undertaken overnight. Numerous political and economic factors must align in-order for the global food industry to change. Large food producers have proven themselves to be sluggish or resistant to the necessary changes needed to alleviate the impending global warming. Pressure from the public on governments and food production companies to reassess the current production system is crucial in-order for there to be significant change. For the public to demand these changes, they need to understand why they are important and how the current globalised food system is detrimental to the environment and ultimately their lives. For this to be achieved, resources and education on sustainability are key.

For there to be significant change, all sectors of society must have a better understanding of sustainability and adopt sustainable practices. Government led initiatives and mandated nudges elevate public awareness, but they do not provide in-depth information on sustainability. Awareness campaigns bring sustainability concerns to the forefront; however they do not necessarily instigate changes in behaviour. Although making small changes towards

sustainable behaviour is beneficial, it often does not equate to individuals taking a greater interest in environmental issues (Crompton, 2008). Small behavioural changes provide a quick solution to larger systemic problems, however what is necessary for significant change is a shift in the public's values and worldview (Sterling, 2011). Developing a deeper understanding of the motivation behind sustainable practice is essential for sustainable changes to become ingrained in everyday life. Knowledge and understanding are also crucial for cultivating interest and a desire to make long-term changes in one's life (ElHaffar et al., 2020). This type of transformative learning is critical within sustainability education, as it builds a connection between an individual's actions and larger environmental issues. "Unlike typical consumer decision making, which classically focuses on maximizing immediate benefits for the self, sustainable choices involve longer-term benefits to other people and the natural world." (White et al., pp 24, 2019). Food sustainability provides an accessible starting point for conversations about sustainability, as it is an area of consumers lives where sustainable practices can be implemented and the benefits can be experienced rapidly. Food sustainability also provides a great entry point for reconnecting consumers to the food production process and larger global food related issues.

## **1.2 Research questions**

- i. What are the factors that inhibit sustainable practices for individuals?
- ii. What are the main causes of household food waste?
- iii. How aware are consumers of food sustainability and sustainability as a whole?
- iv. Is there a public interest in educational resources on food sustainability?
- v. How can educating on food sustainability can be used in urban settings for the betterment of individuals and communities?

## **1.3 Aims & Objectives**

This research project aims to explore food sustainability and education on sustainability. This project will explore food waste in households and consumer sustainability awareness. It will also explore informal education as an avenue to educate within communities on food sustainability. The key objectives to achieving these aims are given below:

- i. The exploration of external and behavioural factors that inhibit sustainable practices for individuals in urban areas
- ii. The examination of how these factors contribute towards food waste and unsustainable food practices
- iii. The examination of the importance of education to achieve transformative behavioural change
- iv. The exploration of how educating on food sustainability can be used for the betterment of individuals and communities

Systemic factors such as culture, society and ecology are deeply interlinked. These factors influence consumer behaviour related to food sustainability and food waste. The secondary objectives of this research are:

- v. Explore how these factors influence day-to-day decisions surrounding sustainable practice
- vi. Explore urban farming the impact urban farming can have on communities and cities. Research the potential of community gardens and farms spaces to educate on food sustainability, food waste and urban farming.

## **1.4 Hypotheses**

As this research contains several objectives, the hypotheses are as follows:

H1: Consumer habitual behaviour will dictate how successfully consumers engage with sustainable practices

H2: Consumer attitudes and habits will be the underlying reasons for most household food waste

H3: The majority of consumers have a basic understanding of food sustainability but require further education on sustainable practices and sustainability as a whole

H4: Consumer education through informal education channels can be an accessible way to educate on food sustainability

## 1.5 Rationale

Household food waste accounts for 6% of worldwide GHG emission (Ritchie, 2020). It is estimated that at least 30% of food produced for human consumption is wasted (FAO, 2015). UK households produce 4.5 million tonnes of food waste, that was edible and could have been avoided (WRAP, 202b). Food waste that occurs within households has a high carbon footprint, as it has accumulated carbon intensity from the processing and transportation stages (FAO, 2015). A lack of knowledge has resulted in a slow uptake of sustainable practices amongst consumers (Ichsan, 2020). Access to education on sustainability is not as accessible to the adult population as it is to those within the formal education system. Non-profit initiatives, such as the Waste & Resources Action Programme (WRAP) have contributed greatly towards the body of knowledge surrounding food waste and have pioneered well-known food waste reduction campaigns, like “Love Food Hate Waste” (WRAP, 2021). However, these campaigns do not always result in long-term behavioural changes (White et al., 2019). Focusing on low-impact changes and ‘private sphere behavioural changes’ distracts from the bigger issues at hand and lulls the public into a false sense of accomplishment (Crompton, 2008). These marginal behavioural changes can adversely result in complacency, as consumers deem these small changes to be enough (Ben-Eli, 2018). External factors, such as finances also discourage sustainable change in consumers as sustainable alternatives are often more expensive (Ichsan et al., 2020).

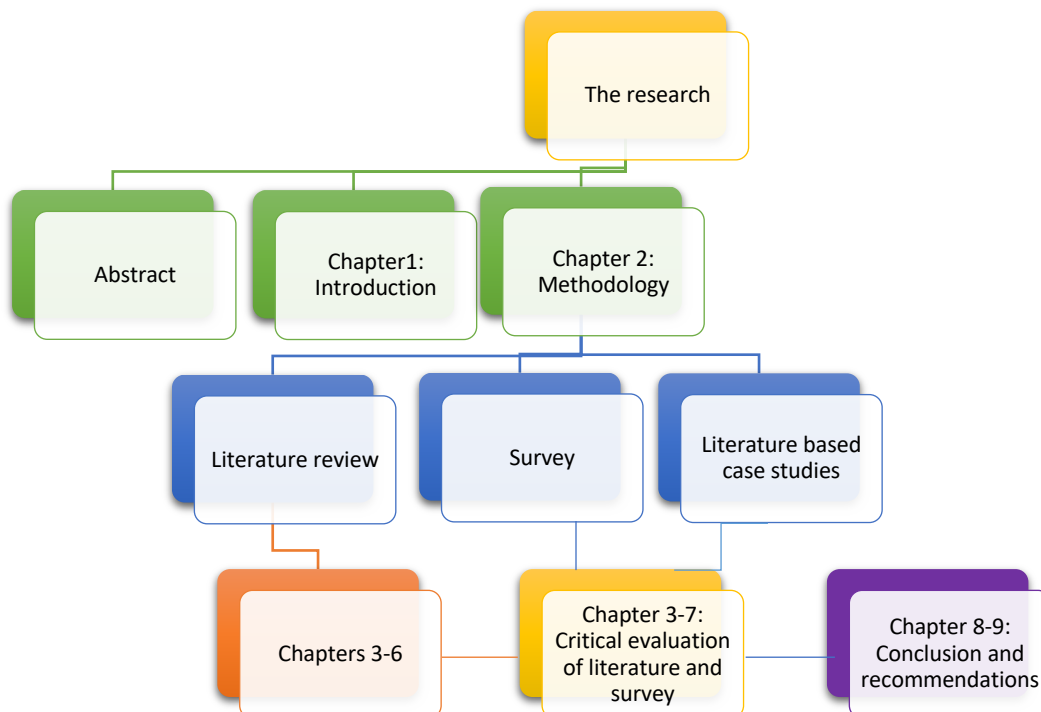


## CHAPTER 2: METHODOLOGY

### 2.1 Overview

This research was conducted via two avenues: literature review and an online questionnaire. On submission and approval of the ethics application, the online survey was launched. All research at the beginning of this study was dedicated towards sourcing relevant articles and books that provide a framework for the development of the survey. Thereafter research moved towards the sourcing literature surrounding the main research topics. Research began with a scoping review of current literature surrounding food sustainability, consumer behaviour and household food waste. This was in order to gauge the current state of household food waste in the UK and understand the behavioural elements of food waste. Existing surveys surrounding food waste and sustainability were sourced to assess existing data and best practices for conducting surveys within this field.

### 2.2 Research structure



### 2.2.1 Literature review

The literature research utilised 150 pieces of literature in the form of articles, books and online publications as references. Once literature research began, the Mendeley reference manager, alongside RefWorks were the tools used to keep track of articles and references. There was no limit on the research inclusion period, however most of the work examined falls within the period of 2015 to present day, as the subject of food sustainability is contemporary. Literature related to Education for Sustainability and behaviour theory drew from older sources, as theory on the subject dates back as far as the early 90's. Literature from social science, food science, economics and behavioural sciences were sourced predominantly via Directory Of Open Access Journals (DOAJ), Elsevier, CORE and Science Direct. In order to obtain a holistic view of the relationship between consumers and sustainability, literature research explored: the current state of sustainability, consumer awareness of sustainability, consumers relationship to food, consumer behaviour around food, food waste, informal education, education for sustainability, and urban farming. Keywords relating to these subjects were used to identify relevant literature. Search results within these categories led to other articles and highlighted secondary topics for exploration.

Once dominant themes began to emerge, papers were grouped and these formed the basis of the research topics list. Targeted research terms that were used include:

**Table 1:** Targeted research terms

Number	Research terms
1	Consumer food waste behaviour
2	Educating in informal settings
3	Education for Sustainability
4	Food sustainability survey
5	Food waste initiatives
6	Food waste management
7	Food waste survey
8	Household food waste
9	Sustainability and consumers
10	Sustainable practices
11	Transformative learning
12	Urban farming
13	Urban sustainability

### 2.2.2 Online survey

The research for this project was retrieved through an anonymous online survey. The online survey was used to collect primary data, the findings were then analysed and discussed. The survey aimed to examine the general public's behaviour as it relates to sustainable food practices and explore their personal incentives for reducing waste. The questionnaire was used to gauge the participants knowledge on food sustainability, understanding of the environmental crisis and their relationship to sustainable practices. The objectives of this survey were to:

- i. Explore behavioural factors that inhibit sustainable practices for individuals
- ii. Assess habits around food shopping and food preparation
- iii. Assess food waste in households
- iv. Explore attitudes towards sustainable practices
- v. Explore attitudes towards sustainability and interest in learning about sustainability

The survey results will contribute towards identifying avenues for educating consumers on sustainable practice. The food sustainability survey was developed based on existing studies on food waste (Herpen et al., 2019) (Jörissen et al., 2015) (Schlange & Co, 2020) (WRAP, 2019) (WRAP, 2021). Design of the questions and sections was informed by Ian Brace's book, Questionnaire Design (2013). The survey was conducted through JISC online, it was distributed digitally via email link. The survey consisted of quantitative and qualitative questions. The questions were predominantly multiple choice and rating scale questions. Analysis methods such as JISC tabulation were used to examine the data and identify whether there is a strong correlation between demographic groups, their attitudes and habits. The open-ended questions were manually coded, based on recurrent words or themes. Sections of the survey included:

1. Background - the participants demographic information
2. Awareness of sustainability - their understanding of sustainability and the environmental crisis
3. Food waste management - their knowledge of food waste management
4. Sustainable practice – their understanding of practicing sustainability

## **CHAPTER 3: LITERATURE REVIEW**

### **3.1 Overview**

The industrial food system is a fragmented network of global and local supply chains (Vermeulen et al., 2012). As a result, it is vulnerable to environmental, political and economic factors. In efforts to lower the risks of these variable, avoid loss of yields and maximise profits, the food production system is reliant on unsustainable practices such as the use of excessive fossil fuels, pesticides and fertilisers. The continued use of unsustainable farming methods results in environmental issues, such as soil degradation becoming industry standards. This short-sighted production process has contributed greatly to the ongoing climate crisis. Although concerns surrounding climate change are highly publicised, the government and private sectors efforts appear to fall short. Consumer awareness has risen significantly, however there are various influences working against climate literacy. This chapter will examine the current relationships between food production, sustainability and consumer awareness.

### **3.2 Food production and the climate crisis**

The production stages of the food system make up 37% of greenhouse gases (GHG) (WRAP, 2021). Processes within agriculture that produce the largest amounts of GHGs include the production of fertilisers, animal feed and deforestation for pastures or fields (Nicholls et al., 2020). Outside of agriculture, the transportation and refrigeration of foods produce significant GHG emissions. GHG emissions from refrigeration is also high in the retail and catering sectors. With rising temperatures and volatile weather patterns, the dependency on refrigeration is expected to rise (Vermeulen et al., 2012). The use of detrimental farming practices like large scale monocropping contribute towards loss of biodiversity, disproportionate production of greenhouse gases and pollution (Nicholls et al., 2020). All these factors put food safety at risk, as new diseases develop, increasing the risk of additional mycotoxins (Vermeulen et al., 2012). COP26 resulted in pledges to support climate-resilient ecosystems and the Policy action agenda for transition to sustainable food and agriculture (PAA) (UN Climate change conference, 2021). The necessity to achieve existing climate objectives in order to ensure food security was recognised (European Commission, 2021). In addition to the PAA, other voluntary pledges were the Global Methane Pledge and the Agricultural Innovation Mission for Climate (Carbon Brief, 2021).

Although the global food system appears to operate fluidly, it is a system that is vulnerable to numerous external factors. Crop outputs appear to be substantial and consistent, however the system is deceptively stable. Without copious amounts of essential fertilisers, many of these produce strains are not resilient enough to survive naturally (Biel, 2016). These chemicals are necessary for consistent yields, yet they have exceedingly destructive effects on the land and soil. Instead of preserving the ecosystems that it depends on, the industrial food system contributes greatly to its decline. “Farming is undermining the ecosystem services it relies upon, and hence a strong argument can be made that current practices are not sustainable.” (Nicholls et al., pp1585, 2020). A sustainable food system encompasses both how food is produced and how it is consumed, it will require ethical sustainable production methods and the reduction of food waste at all stages (United Nations, 2022b).

The devastating effects of the environmental crisis are felt by everyone, however wealthy countries are able to cushion their infrastructures and recover faster from disasters (Wackernagel et al., 2017). Should the adverse effects of climate change not be mitigated, developing countries will suffer the most (United Nations, 2020d). In the same way, all food producers within the global food system are impacted by climate change, but smaller producers are more-so affected. Regional climate determines the quality and availability of food (Vermeulen et al., 2012). Fluctuating crop yields result in disrupted transportation timelines, which impacts availability and ultimately the price of foods. Rising temperatures impact the growing seasons, which results in crop losses, pests and water shortages. Food production is often the only source of income for many farmers, so loss of crops can result in the loss of property and livelihoods. In areas where food is produced for sustenance and survival of a community, these losses can result in malnutrition, disease and mass migration.

The COVID-19 pandemic exposed many issues within the current food industry. Although a globalised food system provides the convenience of availability year-round, when that system breaks down, distribution grinds to a halt. The low inventory supply chain was severely disrupted due to border closures. This led to shortages and lack of accessibility to goods worldwide and highlighted a significant weakness in the Just In Time (JIT) supply chain. Just-in-time systems are reliant on multiple parties coordinating on a large scale, they are systems that requires strict scheduling and are severely impacted by disruptions (Vermeulen et al., 2012). Although JIT systems allow for access to a wide variety of produce throughout the year in the global north, it has resulted in mass-scale monocropping abroad. Food inequalities and

food insecurity have also been highlighted by the pandemic lockdowns. Families unable to travel out of their immediate areas were stuck in food deserts, unable to access fresh produce and basic food essentials. These breakdowns in the existing food system were put under scrutiny as a result of Covid- 19, forcing both government and food industry to begin considering alternatives and ways in which a better system can be built. COVID-19 also brought many changes to human behaviour. It forced people to adapt to isolated environments during lockdowns, which in turn resulted in vast changes to their social behaviours, food habits and attitudes towards sustainable lifestyles. The “awe induced by COVID-19” impacted individuals in many ways, many experienced “negative awe” which resulted in feelings of helplessness and fear (Sun et al., 2021). Numerous individuals also experienced “positive awe”, being motivated by the pandemic to prioritise projects they found to be meaningful and reconnect them with their communities. COVID-19 also pushed people to re-evaluate their consumption habits and their relationship to the planet, some choosing to use their time in isolation to reconnect with nature through gardening and growing food (Sun et al., 2021).

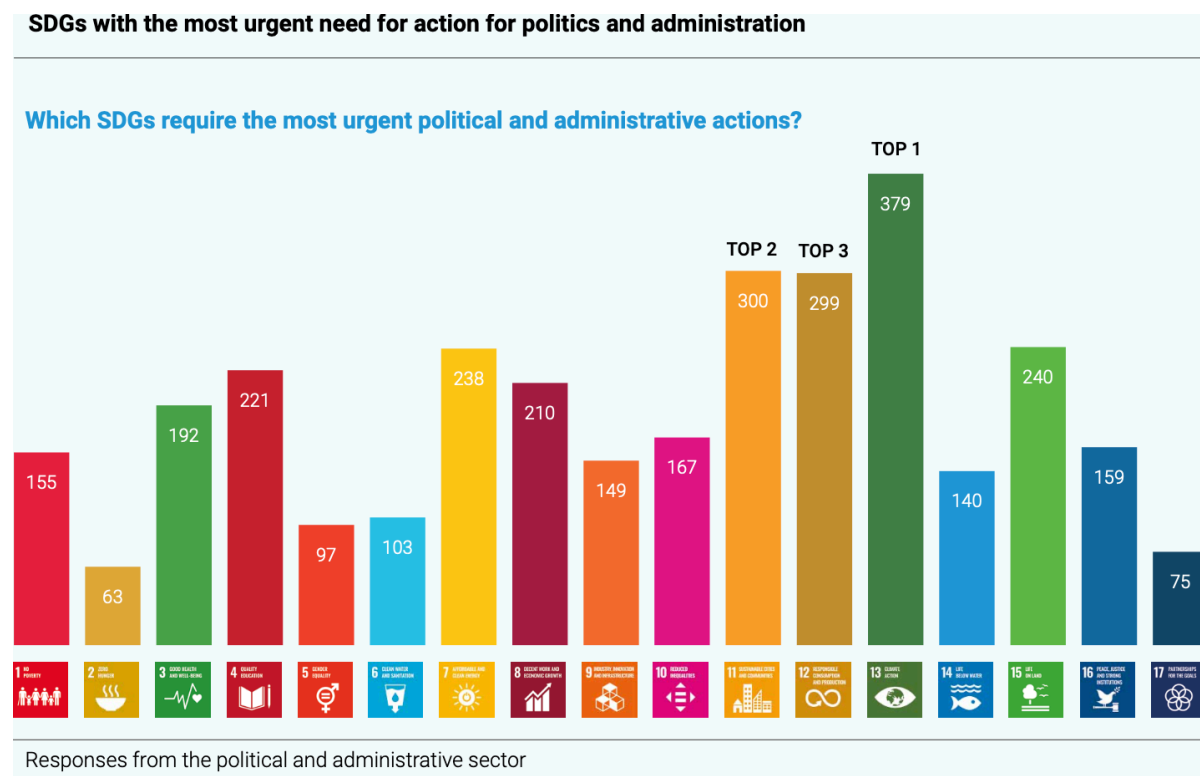
The social injustices of the climate crisis have spurred several environmental movements, such as Decarbonise & Decolonise. The Decarbonise & Decolonise movement aims to address the environmental crisis, whilst tackling social injustices that are the legacy of colonialism (SOS-UK, 2022). Decarbonisation is actively reducing the carbon dioxide emissions in production processes, by utilising low carbon power sources (TWI Global, 2022). Decolonisation is the acknowledgement of colonialism’s impact on the world and working to unravel the negative aspects of its legacy (Gopal, 2021). Decarbonise & Decolonise recognises that, whilst we are all impacted by the environmental crisis, countries in the global south and marginalised groups will be impacted sooner and more severely. Understanding the root causes of the current environmental crisis and the full scale of its impact (environmental, economic and social), is paramount in building sustainable solutions that are inclusive and beneficial to everyone. “The consequences of the climate crisis are not distributed equally, and we can’t begin to understand the origins of the climate emergency without first understanding the history of colonialism, imperialism and Western high-carbon economic systems that have driven us here.” (SOS-UK, pp1, 2021).

In order to address the plethora of issues with the current food system and create a system that can provide sufficient food for present and future generations, substantial changes are required within many sectors of society (Nicholls et al., 2020). The agriculture sector must find solutions to mitigate its GHG emissions, which will require government intervention for there to be significant change (Wackernagel et al., 2017) (Schlange & Co, 2020) (Vermeulen et al., 2012). For this paradigm shift to occur, there needs to be collaboration that galvanises all parties to work towards the same goals. The sustainable development goals are currently the most inclusive global strategy to tackle sustainable development and the climate crisis (García-González et al., 2020). The sustainable development goals (SDG's) consist of 17 goals that provide a framework for the eradication of poverty and a thriving planet for present and future generations (United Nations, 2015). The SDG index provides data on where countries currently stand in relation to the SDG's and the overall state of resource dependence worldwide. At present, current resource usage supersedes resource availability by up to 68% (Wackernagel et al., 2017). The SDG's take all the major issues hindering sustainable development and provide actionable strategies for tackling these goals.

The SDG's encompass concerns such as climate action, gender equality, alleviating poverty and developing sustainable cities (United Nations, 2022a). The SDG's outline the interconnected nature of global issues and highlight how these problems cannot be solved in isolation. SDG's 2 and 12 relate directly to food sustainability. SDG 2 calls for the end of world hunger, sustainable food production systems, improved food accessibility and food security (United Nations, 2022b). This SDG specifically calls for the elimination of food waste. SDG 12 addresses unsustainable consumption and production, recognising the large contribution these actions make towards climate change (United Nations, 2022c).

The global sustainability survey by Schlange & Co, published in 2020 compared results about sustainability awareness and knowledge of the SDG's amongst the private sector, the public sector and the general population. The SDG's were developed to be accessible, making it easy for a multitude of individuals to understand their importance and necessity. Although the SDG's are outlined in order to be accessible to individuals from all walks of life, knowledge of them is not widespread. The Schlange & Co survey found that amongst the general population, fewer than half of the participants were aware of what the SDG goals were (Schlange & Co, 2020). The survey disclosed that awareness of the SDG's amongst respondents working within government and the private sector was low, this result was

particularly disheartening as many of the SDG’s require government involvement for there to be meaningful change (Schlange & Co, 2020).



**Figure 1:** SDGs in need of immediate government action (Schlange & Co, 2020)

In the survey, the SDG’s requiring immediate involvement from governments included climate action (SDG 13), sustainable cities and communities (SDG 11) responsible consumption and production (SDG 12). Steps voted most necessary to be taken on by governments included the implementation and integration of the SDG’s into policy. More governments integrating sustainability into law will allow for its enforcement and regulation. Responsible production and consumption could be enforced with stricter production standards, penalties for non-compliance and sustainability-focused incentive schemes (BEUC, 2020).

Within civil society, SDG’s 12 (Responsible consumption and Production and SDG 13 (Climate Action) were voted to be the most important for the sector, namely pursuing policy. “The majority of respondents worldwide sees the role of civil society as to monitor and exert pressure on legislation and the economy and thus act as a watch-dog in society.” (Schlange & Co, pp 39, 2020). The results of this survey solidify the need for raised awareness about the SDG’S and education on sustainability for the general public. Salient takeaways from the study were the call for responsible production and consumption as the most immediate obstacles for



all industries and the need for there to be collaboration and participation within all segments of society (Schlange & Co, 2020). Mainstream media and government led initiatives highlight the individual contributions to climate change, made by consumers. They focus on how individuals can minimise their personal carbon footprint and the risk we all face should every individual not do their part. Biel states that this risk should be shifted ‘from the realm of consumption into that of production’ (Biel, pp2, 2016). As the SDG’s provide a framework for tackling sustainability from many avenues, publicising and popularising them will allow individuals to attempt sustainable changes in ways that best suit them. The SDG’s can be an ideal learning tool, integrating them into educational courses raises awareness about them and deepens public understanding about the climate crisis at large.

### **3.3 Consumers and Sustainability**

#### **3.3.1 Green Consumerism**

The environmental crisis and sustainability are at the forefront of social zeitgeist. Sustainability and a sustainable lifestyle are fast becoming aspirational, which has led to a surge in sustainable markets in all areas of industry. Although sustainability's rising popularity is a positive and necessary stride, misinformation and exploitation are rife. Many view sustainability as a trend, as opposed to an essential societal shift that is critical for our future.

This new industry of environmentally sustainable products has led to the rise of green consumerism. Green consumerism is the practice of consciously choosing environmentally friendly options in all aspects of life (Ichsan et al., 2020). Green consumers everyday decisions are made with the environment in mind, opting for sustainable alternatives wherever possible. Green consumerism involves practices such as avoiding excessive waste, whilst making efforts to reuse or repurpose items they already own. (Melović et al., 2020). Presently, consumers have access to a rising variety of green products, that are sustainably produced. The sustainability movement has spawned numerous start-ups who work to meet the needs of green consumers. Although green consumerism is beneficial, in that it provides consumers with sustainable alternatives, companies have realised this markets popularity and have begun exploiting the trend. In order to keep up, established businesses now must balance economic growth with adjusting their production processes to be more sustainable (Yu et al., 2020). Brands with unsustainable track records are under pressure to make the necessary changes to align their businesses with the current push for sustainability. As a substitute to overhauling their businesses, many companies resort to doing the bare minimum. They make superficial changes, instead of seeking sustainable and renewable options, then they use greenwashing to appear as though sustainability is a priority. Greenwashing is the practice of utilising marketing to inflate a company's environmental data and pander to consumers (Braga Junior et al., 2019). Greenwashing can be a company concealing unsustainable behaviour via green marketing, or misleading consumers with false labelling that claims unsustainable products are environmentally friendly (Yu et al., 2020). Greenwashing is motivated by profit and reliant on uninformed consumers who desire environmentally friendly goods. Greenwashing contributes to consumer confusion and discourages those who are not knowledgeable about sustainability from participating in green consumerism (Melović et al., 2020).

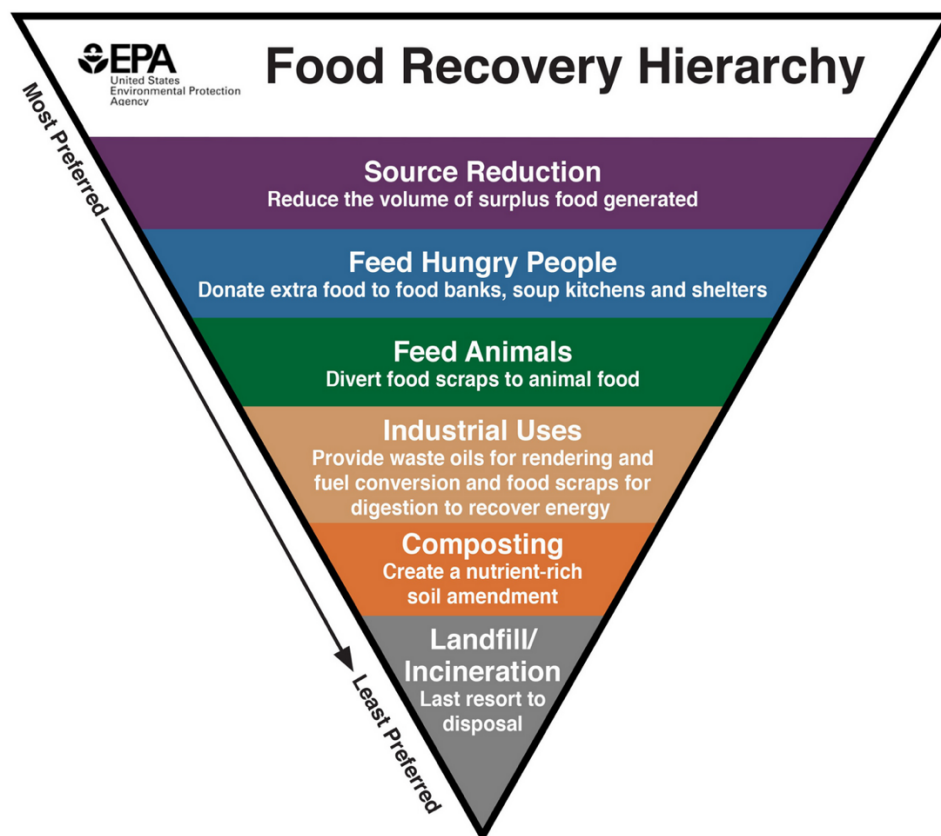
The consumer shift towards environmentally friendly products is a positive one, however sustainability cannot be achieved through excessive consumerism, regardless of how eco-friendly the products are. The climate crisis and stress on finite resources requires reduced consumption in the global north, “higher (resource) demands of some countries reduces opportunities of others to access necessary resources, exacerbating equity challenges” (Wackernagel et al., pp 5, 2017). Some research considers green consumption to be a viable solution to the environmental impact of human consumption, as it allows for the replacement of unsustainable goods with sustainable options (ElHaffar et al., 2020). Whilst green consumption is an important component on the path to sustainable practices, continuing to consume products in excess, regardless of how environmentally friendly they are is still not sustainable. Breaking the socio-cultural habit of shopping appears to be one of the main barriers to green consumerism. The practice of shopping for leisure or as a social occasion is ingrained in many cultures. Education can play a significant role within green consumption, working to reshape the idea of what constitutes green consumption with an emphasis on reduced consumption. Sustainability is now for sale, the effectiveness of green marketing and sustainability trends have culminated in a distinctive aesthetic that is associated with sustainable brands (Ichsan, 2020). Research confirms that some consumers purchase sustainable products because of their popularity, or the social status associated with them (Melović et al., 2020). As a result, many consumers now strive for the sustainability aesthetic and are trying to shop their way to sustainability. It is paramount that there be a greater understanding of what green consumerism should look like and discourage people from shopping their way to sustainability, as shopping is inherently the problem. Educating consumers on subjects such as supply chains and product labelling reduces their vulnerability to misinformation and greenwashing (BEUC, 2020).

### 3.3.2 Sustainability and fashion

The evolution of sustainability in food industry is closely mirrored by sustainability in fashion. In recent years, fashion is an area where consumers have developed an improved understanding of how their consumer choices relate to climate change. With sustainable fashion activists such as Céline Semaan and Aja Barber targeting large fast fashion houses like Zara, sustainable fashion awareness is rising, especially amongst the youth. There is a growing pushback against fast fashion and consumers are starting to demand accountability and transparency from clothing brands, as a result of reported worker exploitation (Pero et al., 2020) and events like the Rana Plaza garment factory collapse in 2013 (Sinkovics et al., 2016). As large clothing brands like H&M are being publicly scrutinised by advocates and consumers, other large brands are pledging to make their production systems circular and committing to recycling clothing and integrating the use of sustainable fabrics (Brooks et al., 2017). Sustainability reporting and social development projects are now an expectation and are becoming a required segment of a company's CSR. Transparency is becoming the norm within fashion, because of the consumer demand for ethically produced sustainable garments.

### 3.4 Food waste

As the climate crisis continues to escalate, the most vulnerable communities are the most affected and currently experiencing the adverse consequences. As the world changes, hunger and poverty continue to be destructive forces within the global south (United Nations, 2020). The industrial food system is linear and homogenised (Biel, 2016), addressing food waste and inequalities within food distribution are important steps towards a more equitable food system. Raising public knowledge concerning food waste and sustainability is also a necessary step. Recent research shows that the disconnect between food production and consumers is stated to be one of the main reasons food waste occurs at such high levels within households (Witzel et al., 2016).



**Figure 2:** Food recovery hierarchy (EPA, 2021)

Food loss refers to loss of yield due to factors such as weather conditions, processing, and overproduction (FoodPrint, 2021). Food loss takes place during the processes of food production, packaging, transportation and distribution. Whereas food waste occurs at resale sites such as supermarkets, restaurants or in households (FAO, 2022). The ratios of food waste

to food loss differ greatly around the world. Within the global north, there is a larger percentage of food waste occurring during the distribution and consumption phases, whereas in the global south, the majority of food is lost during the food production stages (Stancu et al., 2016). It is reported that roughly 65% of household food waste could have been avoided (WRAP, 2021) (Schanes et al., 2018). Food waste is a loss of food that was at some point was fit for consumption (Schanes et al., 2018). Food waste is not only linked with substantial greenhouse gas emissions, it also results in the waste of all the resources used within the food production process (Stancu et al., 2016). “The food itself and the resources exploited in its production, transportation or disposal are used inefficiently. This has unfavourable environmental, economic and social consequences on the sustainability of the food sector.” (Witzel et al., pp 6458, 2015). Argument can be made that global food loss within the production process and commercial food waste are the larger contributors to food waste, however household food waste in the UK still contributes 70% to overall food waste (WRAP, 2021). Preferably food waste reduction should take place at all stages of the Food Recovery Hierarchy, with an emphasis on waste reduction during food production processes and redistribution of surplus stock to those in need (EPA, 2021). This is necessary to minimise the amount of food waste making it to the landfills (Schanes et al., 2018). This would require a reassessment of production methods and potentially penalties to discourage overproduction. 26% of the worlds land is currently used to feed livestock (FAO, 2012), instead of production surpluses being wasted, they can be redirected to the hungry or used to feed livestock (EPA, 2021). Aside from the environmental cost of food waste, it costs households at least 15% of their household food budget (Stancu et al., 2016). The majority of household food waste is avoidable, with the necessary knowledge and practical day-to-day skills, food waste prevention is an achievable solution and could contribute greatly towards reducing its environmental impact. Having a better understanding of the reasons households throw away food can provide the data needed to develop frameworks for household food waste prevention strategies. Numerous food waste campaigns have taken place in recent years, most notably the “Love Food Hate Waste” campaign. “Love Food Hate Waste” (LFHW) is a national campaign by the Waste and Resources Action Program (WRAP) that began in 2007 and continues to be a forerunner in the fight against food waste. LFHW continues to provide the public with actionable practices that they can incorporate in their lives to help reduce food waste. LFHW’s success can be attributed to its research-based approach and constant evolution. Whilst the progress the LFHW campaign has made is deeply commendable, raised awareness does not always translate into behavioural changes (Loeber et al., 2007) and there is still a lack of educational resources for

consumers. The majority of large-scale campaigns promote marginal behavioural changes, in the hopes that they will have a big impact on a large scale. Although research shows that behavioural change is possible through nudges, these nudges do not always impart further understanding or motivate individuals to make further changes (Ichsan et al., 2020).

### 3.4.1 Plastic packaging

Single use plastic has been a target of the sustainability movement for many years. What began in the public sphere as an urgent need to eradicate plastic straws has now shifted towards plastic reduction in all areas of consumer life. The growing sustainability movement has urged manufacturers to explore plastic-free packaging and packaging options made from recycled materials (Jerzyk, 2016). Recently studies show actions such as selling fruits and vegetable loose, as opposed to pre-portioned bags, could significantly reduce household food waste (WRAP, 2018) (Schanes et al., 2018). The market for reusable goods such as cups, carrier bags, straws and cotton pads is steadily growing (Ichsan et al., 2020). It is now commonplace to find several bamboo or metal alternatives to household items that have traditionally been made from plastic. There has also been a shift away from virgin plastic, towards plastic that are recycled (WRAP, 2018). Along with all these plastic-free alternatives a particular style of sustainable marketing has emerged alongside it (Boz et al., 2020). The pendulum is beginning to swing back from zero plastic, to reducing plastic, as consumers are starting to understand that plastic is not inherently bad, however utilising disposable single use plastic in excess is unsustainable. As a result of the zero-plastic wave, there has been substantial progress in the development of compostable and biodegradable packaging. Packaging manufacturers now must consider sustainability alongside food safety and transportability when developing packaging (Boz et al., 2020).



### 3.5 Summary

A sustainable food system not only encompasses food production, but all events from production to consumption and ultimately, disposal. All these events are connected, and one cannot rectify one problem without addressing the others. The interconnected nature of these issues continues to become more apparent as the environmental crisis escalates. “We cannot fundamentally address food issues without addressing the whole structure of society” (Biel, pp7, 2016). Many industries now must consider sustainability alongside economic growth in order to maintain their markets (Boz et al., 2020) as the pressure mounts for manufacturers to reassess their industries and shift towards more sustainable business models (de Frietas Netto et al., 2020). Consumer awareness of the climate crisis is at an all-time high and green consumerism is on the rise. Although this is advantageous to the flourishing green market, it has also opened the door to greenwashing. Green consumerism is part of the solution, however, educating on reduced consumption and its importance for the environment is paramount. Green consumerism requires all members of a household or community to understand the importance of environmental preservation in order to practice green consumption (Ichsan et al., 2020). Food waste, especially that from household’s accounts for a vast amount of food waste in the UK. Although awareness is high, government initiatives and nudges alone are not a bulletproof solution.

## **CHAPTER 4: CONSUMERS AND FOOD WASTE BEHAVIOUR**

### **4.1 Overview**

Food waste and food loss takes place at all steps of the food production process. From growing or rearing the food source, waste takes place in order to meet industry and customer expectations in relation to cost, physical appearance and every-changing food trends. “Food waste refers to food appropriate for human consumption being discarded, whether after it is kept beyond its expiry date or left to spoil.” (De Meo et al., pp 4, 2018). This is food that has deteriorated past the point of consumption and is discarded. Sustainability within households is an area where consumers have substantial control over their sustainable practices, particularly when it comes to food waste. Household food waste does not begin in the home, it is the culmination of many decisions and behaviours related to food consumption. Shopping behaviour, food storage, attitudes towards food preparation and food management are all stages within the household where food waste can be minimised. Habits such as buying behaviour directly impacts food waste, whilst cooking skill level has an indirect impact. Both direct and indirect factors are opportunities to intervene and change behaviour (Di Talia, 2018).

### **4.2 Barriers to sustainable practice**

During a time when the environmental crisis is being heavily publicised, the general public are more familiar with movements and causes highlighting sustainability. Food waste is not novel or specific to the environmental crisis. Due to social economic or political events, food scarcity and maintaining food security has always been a consideration at different points in history. Although it is presently associated with environmental awareness, it is a fundamental practice in many societies due to the impact of external factors such as poverty, drought, war and geographic location. The day-to-day behaviours practiced within households are the product of identity, upbringing, habits, attitudes and values (Terlay & Hirsch, 2015) (Schanes et al., 2018) (White et al., 2019). All these components work to encourage or hinder sustainable behaviour. The barriers to sustainability have been divided into three categories: social, financial and behaviour barriers. These groups overlap and in some instances are not clearly defined. Whilst considerable research has been done on food waste behaviour, theory cannot predict all behaviour (Schanes et al., 2018).

### **4.2.1 Social Barriers**

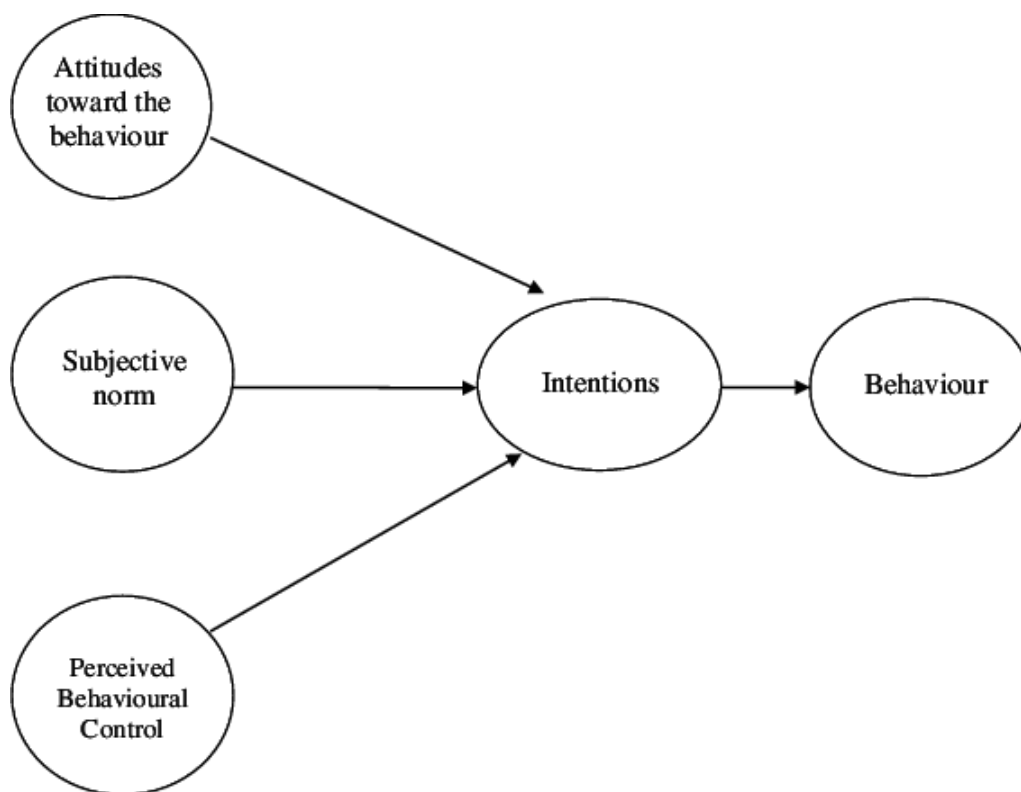
Social influence plays a significant role in the uptake and practice of sustainable behaviours (White et al., 2019) (Witzel et al., 2015). When sustainable behaviours are normalised or viewed as aspirational within communities, they are more likely to be widespread. Social norms are the general rules that individuals follow to adhere to the cultural and behavioural norms within their community. They dictate how community members interact with their surroundings and how effectively communities engage with services and amenities. These include whether or not individuals will avoid littering, recycle and dispose of the household waste appropriately (White et al., 2019). Factors such as social influence have been confirmed through research to have a significant impact on how individuals respond to sustainability rhetoric (Witzel et al., 2015). Social influence is also referred to as “social desirability” (Herpen et al., 2019). If a sustainable practice is not a part of the social norm within a community, there is a reduced or slower uptake of the practice. Social norms are driven by community leaders, cultural norms, laws and regulations (Melović et al., 2020). Social norms are also influenced by guilt and a need for community belonging (White et al., 2019). How fellow community members will perceive one’s actions, impacts how individuals conduct themselves within society. If certain food behaviours are frowned upon or condemned by a community, people are less likely to partake in that behaviour out of fear of being judged.

### **4.2.2 Financial barriers**

Financial barriers are often the most crucial barrier when food shopping, as a result they influence the types of products and quantities individuals can purchase (Terlay & Hirsch, 2015). For many consumers, there is a stronger incentive to save money than there is to save the planet (Schanes et al., 2018). Although consumers have the ability to choose what they buy, they usually get “locked” into food habits. External factors such as accessibility and finances dictate what they can buy, restricting their options and “locking” them into unfavourable food behaviour. “Lock in occurs in part through perverse incentive structures – economic constraints, institutional barriers, or inequalities in access that actively encourage unsustainable behaviours” (Crompton, pp 25, 2008). Finances are one of the main factors that inhibit green consumerism in day-to-day decision making. Whilst consumers may be aware of environmental crisis and eager to purchase more eco-friendly alternatives, many report that they are too expensive and resort to purchasing less sustainable options (Ichsan et al., 2020). Although finances may inhibit the purchasing of more expensive sustainable alternatives,

financial concerns can also reduce food waste (Schanes et al., 2018.) Many consumers view throwing away food as a waste of money, so they try to avoid food waste for this reason. When operating within financial constraints, consumers will prioritise their financial and food security, over their environmental concerns (BEUC, 2020).

#### 4.2.3 Behavioural barriers



**Figure 3:** Theory of Planned Behaviour (Tommasetti et al., 2018)

Habits and routine play a large role in food waste, understanding routines surrounding shopping and food preparation emphasises the points within these routines that lead to food waste. The ‘Theory of Planned Behaviour’ states that an individual’s attitude towards a behaviour shapes how well they perform that behaviour (Stancu et al., 2016). People’s motivation, factors that cause resistance or contribute to its difficulty dictate whether that action is taken out (Boston University School of Public Health, 2019). The results of performing the action and any perceived reward also influence behavioural performance. If an individual does not enjoy the process i.e., cooking, they may avoid it, prolong doing it or opt for an alternative. The theory of planned behaviour works well in rationalising many of the behaviours that contribute to food

waste. A lack of desire to perform actions related to food preparation or consumption could result in food spoiling and going to waste. Whilst the Theory of Planned Behaviour provides a good framework for understanding the factors that impact behaviour, it perceives behaviour as linear and does not consider finances as an influence (Boston University School of Public Health, 2019).

### **4.3 The Attitude Behaviour Gap**

The attitude behaviour gap highlights the chasm between good intentions and quantifiable action. It is the gap where intent and will determine whether an action is taken (Schanes et al., 2018). The green attitude-behaviour gap accounts for the discrepancy seen in many studies between participants expressing distress for the planet and taking practical steps to make their lives more sustainable (Ichsan et al., 2020). Factors that impact green behaviour are much like those that influence the theory of planned behaviour, however knowledge and worldview play a more significant role here (ElHaffar et al., 2020). Although climate awareness is steadily rising, the number of consumers making the switch to green alternatives does not correlate (Melović et al., 2020). Consumers are aware of the gap between their concerns for the planet and the unsustainable choices they make day-to-day. In order to reconcile the uneasiness they feel when confronted by this fact, they use coping mechanisms, “Although the mechanisms may drive consumers to compensate for their green gap behaviour.. they undermine personal and societal values” (ElHaffar et al., 2pp 13, 020).

#### 4.4 Behavioural change

Food waste becomes embedded in the everyday routine and part of a household's food practice. Individuals are often unaware of exactly how much food waste they create and its effects on the environment (BEUC, 2020). Household behaviours and scripts around food provide good indicators for food waste. Household food scripts are the habitual actions and decisions that make household food routines. Many households conducted their shopping at a routine point in the week. Whilst shopping, they purchase many of the same products, at the same retail outlets. Consumers are often resistant to veering away from these routines, as making behavioural changes is often viewed as inconvenient (White et al., 2019). It often requires significant shifts in day-to-day behaviour and can take some trial and error. Strategies for habitual change vary, some researchers advocate for ease and accessibility, whilst others believe education is the answer. "Initiatives aimed at focussing on the injunctive norms of not wasting food can have the largest impact on intention, which subsequently impacts behaviour.. direct efforts to change consumers' attitudes towards food waste have the potential to lead to decreases in food waste through intentional processes. If the intentional route is used, the efforts to strengthen injunctive norms coupled with changes in consumer attitudes towards food waste may contribute to the largest decrease in food waste." (Stancu et al., pp 16, 2016).

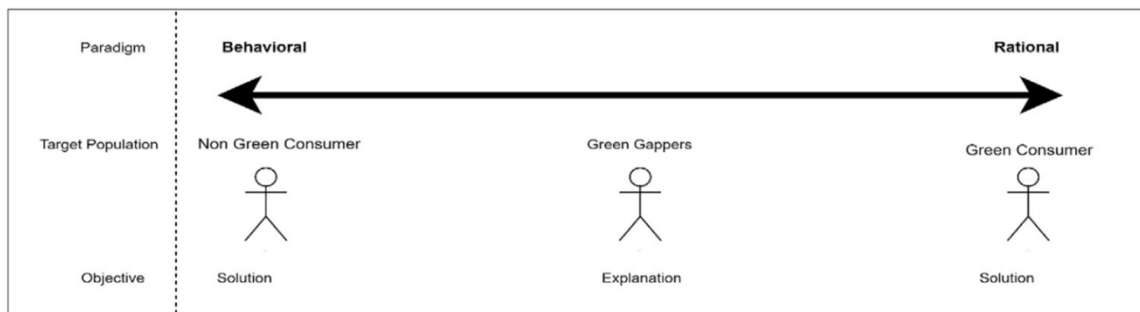
Many researchers advise that changes be made as easy as possible, as this will lead to more people engaging in sustainable practice. "Contextual changes that improve the ease of engaging in sustainable behaviours, such as placing recycling bins nearby, requiring less complex sorting of recyclables... encourage such behaviours" (White et al., pp 26, 2019). Alongside easy changes, clear prompts related to the behaviour have been found to be beneficial. Reducing the effort threshold can result in more people adopting sustainable behaviours, which can eventually lead to making these behaviours the norm. Incentivising behaviour change through rewards can have an impact, such as paying individuals for every bottle they recycle. Ongoing rewards like this provide an incentive that can lead to the behaviour becoming habitual. Once-off rewards can result in a considerable increase in the amount of people who participate in a behaviour, however there is usually a significant decline in continued behavioural change once there is no-longer an incentive (Di Talia, 2018) (White et al., 2019). Although penalty systems are good to regulate behaviour, if the penalty or requirements to avoid penalty are exorbitant, this could cause a backlash (White et al., 2019). Whilst a penalty system would discourage unsustainable behaviour, it does not encourage a learning experience. This results in

individuals would abide by the rules to avoid punishment, as opposed to learning about why the change in behaviour is important or beneficial. When education is the goal, a penalty system does not appear to be the best approach when trying to bring about understanding and a change in values.

Research states that communities tend to trust their municipalities with regards to the correct recycling of their waste (Witzel et al., 2015). Government led recycling campaigns contribute to the social norms around food waste, communities that have allocated bins for specific waste and surveillance located near bin storage are more likely to dispose of their waste correctly. Having surveillance installed near bin storage areas can also lead to individuals feeling guilty should they not dispose of their waste correctly (White et al., 2019). Tactics like surveillance do raise the likelihood of correct disposal of waste, however it can also lead to feelings of resentment within individuals, campaigns that motivate through positive reinforcement could lead to more long-term positive change. The way in which sustainable lifestyles changes are promoted is important and plays a part in the uptake of sustainable practice (Crompton, 2008). If changes appear difficult or too time-consuming, participants are less likely to incorporate them into their lives. It is important that living more sustainably is viewed as accessible to everyone. Industry can contribute towards closing the attitude behaviour gap by making information regarding product sustainability clear and comprehensive, to encourage the purchase of sustainable alternatives (BEUC, 2020). Manufacturers can also implement schemes where they take back their unrecyclable packaging, in order to reduce the burden on consumers.

Whilst small changes lower the threshold to sustainable behaviour, some researchers argue that focusing on low-impact changes and 'private sphere behavioural changes' distracts from the bigger issues at hand and lulls the public into a false sense of accomplishment (Crompton, 2008). Promoting small changes distracts individuals from putting their energy into addressing more meaningful change. Once-off sustainable changes (such as changing to energy efficient light bulbs) do not require habitual change, these are first order changes (Ben-Eli, 2018). First order changes are small immediate fixes that do not require a deep level of understanding from consumers. Many government nudges often result in first order change. The public implement the changes, without a true understanding of their importance and overall impact on the environment. The general public know to separate their household waste into recyclable and general waste, however the motivation and understanding of why does not go much further

than it being good for the environment. Sustainable behaviours such as food preparation and food shopping require ongoing engagement, thus they require long-term habitual change (White et al., 2019). In order to achieve long-term change in habitual behaviour, there needs to be second order change or transformative change. This can be achieved through transformative learning. Transformative learning is a shift in worldview that is incited by a learning experience that causes an individual to reframe their perspective (Sterling, 2011). Learners are exposed to information that challenges their existing beliefs and encourages them to consider new ways of thinking. Transformative learning is essential when educating on sustainability, as the goal is to change both their habitual behaviour and beliefs (Loeber et al., 2007).



**Figure 4:** Consumer behaviour paradigm (ElHaffar et al., 2020)

Recent studies have found that consumers who do not have a great awareness of sustainability respond better to behavioural change through nudges, whereas those who have are knowledgeable about sustainability respond to being given more information about sustainability (ElHaffar et al., 2020). This expands on their existing knowledge, reaffirming their motivations to engage in sustainable practice. In order to reach everyone, an approach that combines behavioural nudges, information and education appears to be the best strategy to accelerate sustainable behaviour in the general public.

Individuals who identify as environmental consumers, or sustainably conscious have a high probability of making more sustainable choices, as it is part of their group identity and they want their group to be viewed in a positive light (White et al., 2019). The desire to belong to this group incentivises individuals to behave in a specific way and purchase certain goods in order to remain within the group. Whilst encouraging behavioural change through social identity can have a positive impact, it can also have a negative effect. In the same way it attracts certain individuals and encourages certain behaviours, it can deter those who feel they do not



belong within the group, or they cannot meet the required standard. A notable example of this can be found in the topic of veganism. Many people turn to veganism because of its environmental and ethical benefits, whereas the majority find the lifestyle requirements too extreme or demanding (Dhont and Stoeber, 2020). The strict ethical nature of veganism makes many hesitant to try it, as there is a very all or nothing mindset amongst ethical vegans. As a result, veganism is viewed as too radical, leading fewer people to commit fully to it. The general public are more comfortable with increasing their vegetable intake or incorporating practices such as “Meat-free Mondays” (WRAP, 2019). Consumers are also willing to incorporate traditional vegetarian products (like meat-free patties and sausages) into their diets, as opposed to giving up meat altogether (Schanes, 2018). It is important to avoid alienating the majority by making sustainable practice too difficult or inconvenient, however, the change needs to be significant enough and on a large enough scale to have an impact. A combination of first order and second order changes appears to be the most beneficial route, providing both behavioural and educational solutions (ElHaffar et al., 2020).

## 4.5 Summary

Individual and societal attitudes towards sustainability are deeply influenced by culture, values and worldview (Xue & Et al., 2014). All these factors contribute towards how groups within society interact with nature and in turn, work towards its preservation or destruction. Environmental issues such as climate change can often feel distant as individuals do not feel connected if they are not directly impacted. Although an individual may understand the need for sustainable practices, there is often a disconnect when it comes to understanding how this applies to them. The ‘consumption mindset’ continues to play a negative role in the way individuals relate to the environment (White et al., 2019). Although they are aware of the environmental crisis and the need for reformation, the majority do little to change their actions, this is known as the ‘attitude-behaviour’ gap. When members of a community identify as part of a pro-environmental group, they are more likely to engage in sustainable behaviour (White et al., 2019).

The greatest challenge facing change in consumer behaviour is closing this gap and instilling long-term behavioural change. For this reason, consumer food sustainability cannot be resolved in isolation. It cannot be resolved through small mindless actions. Approaching sustainability holistically is key and this can only be achieved through education. “Consistent with a holistic approach to sustainability, improving environmental sustainability can result in both social and economic advances” (White et al., pp 24, 2019). Whilst some scholars advocate for sustainable changes that are easy and incentive driven, these changes do not provide any encouragement to learn more about sustainability. Many researchers advocate for education as an avenue towards behavioural change within the general public (Loeber, 2007) (Sterling, 2011) (ElHaffar et al., 2020). All the individual behaviours related to food consumption within households (shopping, cooking, storage and ultimately waste) connect and become a households food routine or food choice script (Stancu et al., 2016). How food is stored, used and disposed of are all areas for intervention and opportunities to reduce excessive waste. This type of transformative learning for the general public can be achieved through interactive or experiential learning.

Several studies report that the majority of consumers do not see sustainable behaviour as a priority in their lives (ElHaffar et al., 2020) (Schanes et al., 2018). Their personal lives coupled with a general apathy towards sustainability leads people to not act on their climate fears. A

lack of information and education on sustainability are often named as contributing factors to this issue. Theory such as the theory of planned behaviour and the attitude behaviour gap can provide insight into why individuals perform certain food related behaviours. Although first order change can be viewed as superficial, it plays an important role on the path to more sustainable communities. First order changes need to be used in conjunction with other behavioural change incentives to realise their full effect. First order changes also do not resolve the issues further up the chain that impact the levels of household waste. Large-scale producers need to pursue plastic alternatives, reduced packaging and correct disposal of their waste, as this directly contributes to household waste.

## **CHAPTER 5: EDUCATING ON FOOD SUSTAINABILITY**

### **5.1 Overview**

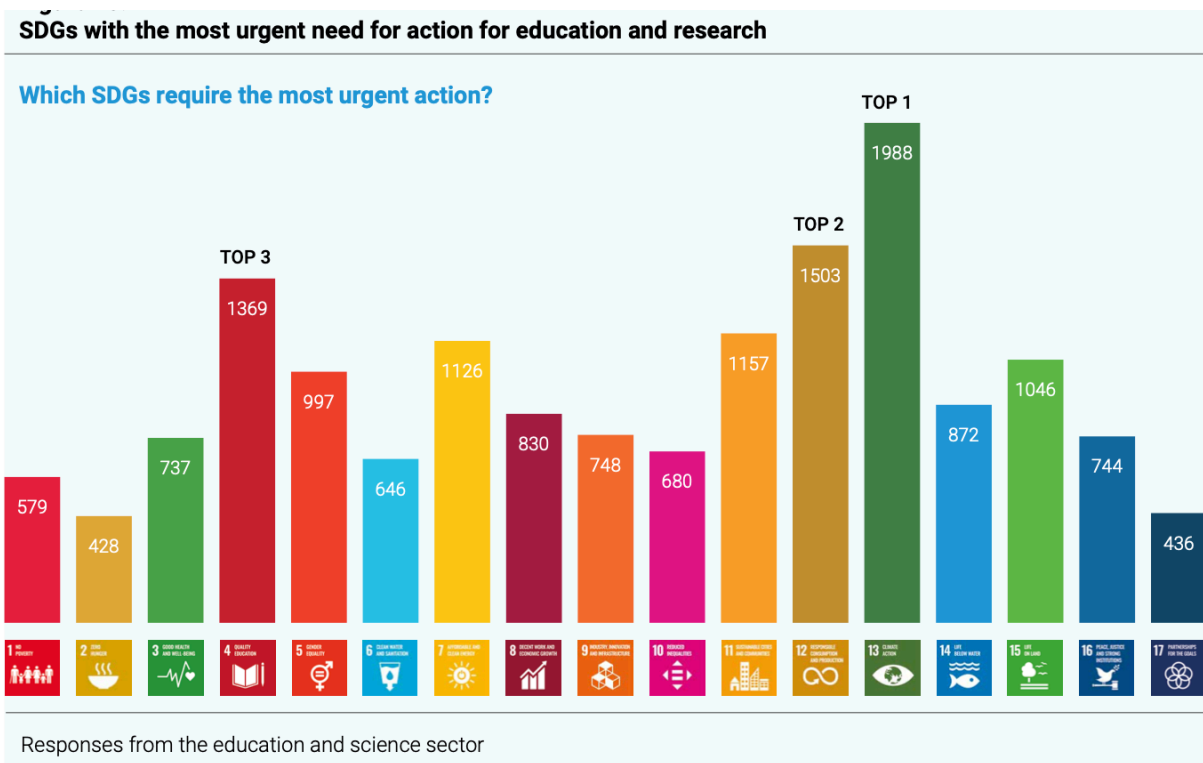
Educating on sustainability is paramount, as it provides individuals with necessary knowledge and practical skills, allowing them to be active participants in the sustainable development of their towns and cities. “It is necessary to empower individuals through competencies that encourage reflection on their own actions, taking into account the effects in different spheres and at different scales” (García-González et al., pp 1, 2020). Educating consumer on food sustainability impacts 3 major areas of consumer lives:

**Health** – sustainable food practices encourage healthier diets. Practices such as lowered meat consumption, growing foods, pickling and fermenting foods all contribute to good health and can also improve people skills for handling food (Biel, 2016).

**Economy** – sustainable food practices reduce food costs as consumers are more conscious of their spending. They are also reducing food waste, which results in less money lost (Ichsan et al., 2020).

**Society** – educating on food sustainability imparts individuals with knowledge, which they can then share within their households and communities (García-González et al., 2020). Practices such as growing food of community gardening also improve social relationships.

Educating on food sustainability teaches individuals to approach their food holistically and become aware of how interconnected the food system is with societal, economic and political issues. Although education has been identified by many scholars as an ideal solution, viable avenues and programs catering towards public education on sustainability are not as prevalent.



**Figure 5:** SDGs in need of action in education and research (Schlange & Co, 2020)

Within academia, SDG 4 (Quality education) was one of the highest voted sustainability goals that require immediate action (Schlange & Co, 2020). Many of the SDG's link consumer education and food sustainability: good health and well-being (SDG 3), responsible consumption and production (SDG 12), sustainable cities and communities (SDG 11) (United Nations, 2022a). These SDG's can be broken down into functional steps for everyday life or used as opportunities for lifelong transformative learning. Understanding the SDG's can provide additional correlation between individual actions and the global crisis (García-González et al., 2020). Incorporating the SDG's within education courses provides an opportunity for individuals to understand where the SDGs connect to their lives and how they can take steps towards their implementation in their households, communities and cities. Informal education creates opportunities for people outside of the formal education system to gain an understanding of the SDG's. It allows them to make the connection between the SDG's, their lives and sustainability on a global scale.

Educating individuals on food sustainability not only imparts knowledge, it also provides participants with day-to-day skills that they can apply in their lives and see almost immediate results. Practical skills that contribute to food sustainability include: food preservation techniques, food preparation skills, food storage and management within the home and urban

farming. Current research advocates for raising awareness surrounding climate change and sustainability, this coupled with sustainable practice skills provides a two-pronged approach to sustainability literacy and sustainable practice. The next crucial step is providing informational resources and educating consumers on climate change and sustainable practice to reduce household food waste (Witzel et al., 2015) (BEUC, 2020) (García-González et al., 2020).

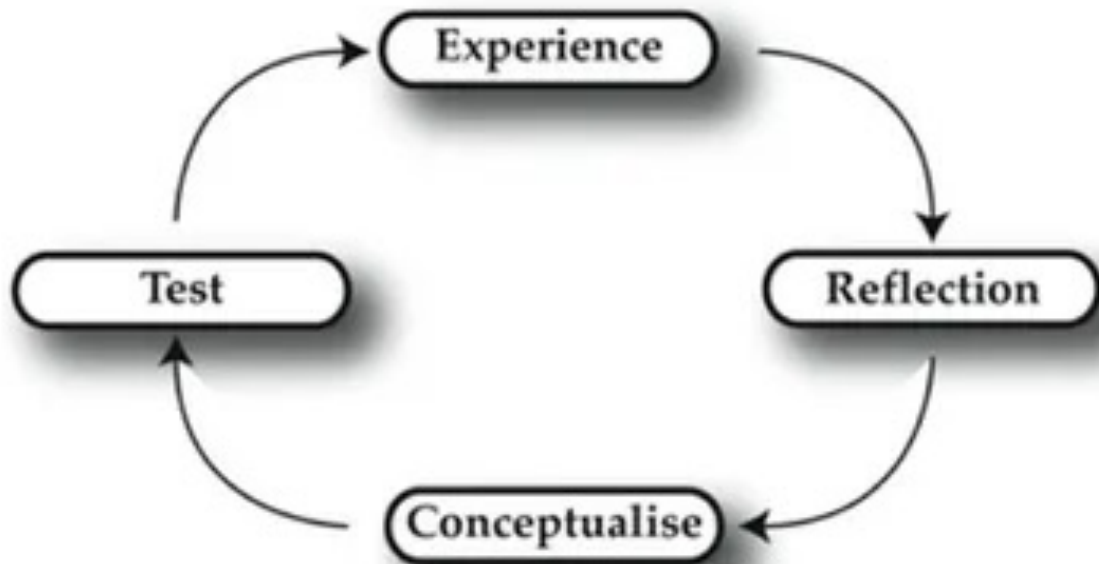
## 5.2 Food sustainability and EfS

Education is an integral part of human society, as it shapes an individual's worldview (Bartlett et al., 2001). In the same way we have learned to live unsustainably, unsustainable behaviours can be unlearned. Education for Sustainability aims to instil the essential principles and values that contribute to sustainable living habits (Sustainability in schools, 2015). Educating the public on food sustainability require a holistic approach that encompasses social, behavioural and cognitive factors (García-González et al., 2020).

Education for Sustainability (EfS) is “a transformative learning process that equips students, teachers, schools, and informal educators with the knowledge and ways of thinking that society needs to achieve economic prosperity and responsible citizenship while restoring the health of the living systems upon which our lives depend” (Cloud, pp 2, 2014). EfS is multidisciplinary and draws from environmental science, environmental education, philosophy and history. EfS within the context of food sustainability involves, creating learning environments where individuals learn to understand their relationship to the environment and are taught the skills needed to find sustainable solutions (Ison, 2008). In understanding the connection between their individual actions and the global consequences, transformative learning can take place. Due to the current concerns about climate change and media attention on worldwide climate strikes, more people are aware of their impact on the environment and the planet. As awareness within the mainstream grows, some individuals feel compelled to learn more about sustainability and implement changes in their lives. EfS aims to kindle this desire for information into community members who want to be advocates for change. Much of the existing work surrounding sustainability education is related to formal education and higher learning education. The formal education sector has begun incorporating sustainability into its curricula, providing dedicated courses within tertiary education. Whilst this is an encouraging development, formal education does not cater to everyone. Unless there is a push for resources and courses for the general public, those who are not in formal education will continue to be uninformed about the current climate crisis.

Existing EfS research advocates for experiential, participatory and collaborative learning when educating on sustainable development (García-González et al., 2020) (Sterling, 2011) (UNESCO, 2011). EfS utilises Kolb's reflective cycle as a framework for educating, as

educating on sustainability is an ongoing process and a commitment to continual education. Kolb's learning cycle is a 4-stage experiential learning cycle, that outlines effective learning (McLeod, 2017).



**Figure 6:** Kolb learning cycle (McLeod, 2017)

Kolb's learning theory states that experiential learning involves applying concepts in various situation to find solutions, reassessing and making efforts to improve after each attempt. The four stages are:

1. Knowledge is shaped through the experiences
2. Reflection is used to overcome any inconsistencies between the experience and understanding
3. Reflection gives way to better understanding and new ideas
4. These ideas and understanding are implemented (McLeod, 2017).

The reflection and conceptualisation phases are where the identification and analysis of one's worldviews take place and are the crux of transformative learning and lasting behavioural change. Transformative learning can be difficult as it may challenge an individual's existing beliefs and pushes them to digest and embrace information that was previously unknown to



them. Personal perspectives influence different people's boundaries on the same subject, this in turn limits their thinking to their sphere of personal interest (Ison, 2018). Within the context of education, it is important for participants to step back and critically examine their boundaries and make the connection between the larger environmental crisis and their sphere of personal interest.

Reflection is important as it allows learners to absorb new knowledge and reevaluate existing knowledge and values. A paradigm shift cannot only be a shift in knowledge and values, but a shift in approaches to food sustainability that encompasses the principles of sustainable practice. Sustainable practices embody individual actions and attitudes towards food sustainability and those of a community. It incorporates the individual actions we can take and those that can be taken within society from local to global scales. Reflection is an essential process when educating on sustainability, as sustainability requires individuals to be introspective and considerate in their daily lives. It requires consideration for your wellbeing, community and nature. Reflecting on one's current actions, understanding their consequences and the steps that need to be taken in their lives towards sustainable practice is where transformative learning takes place. EfS aims to encourage this transformative learning by building understanding and making both learners and educators adaptive. EfS encourages skills development and empowers all individuals to be driving forces of change (Noghuchi et al., 2015).

EfS uses a combination of progressive and socially critical educational approaches. Whilst neo-classical educational approaches ensure that all the relevant information is delivered, they do not allow room for learners to share their knowledge and experiences. The neo-classical teaching approach is used in most schools, as it imparts knowledge in a concise way, however it can be viewed as authoritative and does not allow an environment of shared knowledge and conversation to be cultivated. The sharing of lived experiences and integrating them into education creates a more fruitful and personalised learning experience. For food sustainability, taking a learner's background, household dynamics and financial limitations into account, creates a more fruitful learning experience. This subsequently increases the likelihood of long-term behavioural changes. This approach is especially important when educating individuals who come from different social/economic backgrounds, taking their lived experience into account ensures that everyone gains something from the course that they can implement in their lives.

### **5.3 Informal education**

Educating on food sustainability connects individuals to their food and their community. Educating within informal settings creates avenues for self-organisation and food sovereignty within communities. “The development of a sustainable society should be seen as a continuous process of learning and change, involving a variety of actors providing guidance and leadership in formal, non-formal and informal learning.” (UNECE, 2011 p.2). Informal education allows for the inclusion of traditional knowledge, personal experiences and collaboration as learning resources, creating an environment where tailored education can take place. Implementing EfS approaches within informal education settings creates learning environments where transformative learning can happen, mindsets can shift and skills can be learned for practical change.

Informal education is learning that takes place outside of a formal education system. Informal education is an ideal channel for educating on sustainability, as it caters to the general population (Noguchi, 2015). Individuals no longer in formal education will often seek avenues through which they can educate themselves via informal education options, these take place in the form of weekend workshops, night classes and online courses. For these individuals, informal education can be a cost-effective way to educate themselves and develop new skills. Informal education provides individuals options such as self-learning, one-off projects, community initiatives or ongoing courses that provide certificates (Jeffs & Smith, 2011).

Although informal education appears to be an ideal avenue for educating on food sustainability, it does face challenges. Participants may be inhibited for many of the same reasons that inhibit sustainable practice in their lives. Issues such as the attitude-behaviour gap and economic barriers may inhibit the uptake of sustainability education. For this reason, it is important for sustainability education to be supported by local councils and government, to improve its affordability and accessibility. The learning environment also contributes greatly to the learning experience and encourage or hamper the learning process (Loeber et al., 2007). Creating learning environments where individuals can lower their defences and open themselves to new ways of thinking is imperative in the journey towards a more sustainable society (Loeber et al., 2007). It is vital for informal education courses on food sustainability to be adaptable. Not only to the participants, but to the ever-changing environmental crisis. As climate change continues to disrupt what is deemed to be normal, educators need to be able to

adapt their material and keep it current. Educational approaches such as collaborative learning approach allow for adaptability.

### **5.3.1 Learning approaches**

EfS advocates for several educational approaches that stimulate cooperation, participation and lifelong behavioural changes in learners. These educational approaches can be used to foster transformative learning, elements from them can be used when developing educational resources for informal education settings (Weber, 2021). EfS learning approaches centre the learners experience and often utilise enquiry-based learning to encourage whole systems thinking (Cloud, 2014).

#### **Collaborative learning**

Collaborative learning is important in community settings, as it allows participants to be stakeholders in the development of their surroundings. Collaborative work is known to have a positive impact on students' worldviews, as they are encouraged to question their personal values and beliefs (García-González et al., 2020). In this way, collaborative learning can be transformative, however it does require some vulnerability from the participants "In the Collaborative learning environment, the learners are challenged both socially and emotionally as they listen to different perspectives" (Laal & Laal, pp 491, 2012). Positive interdependence is an important part of collaborative learning, as participants are required to depend on each other in order to progress towards their collective goals (Laal & Laal, 2012) (García-González et al., 2020). Without effective trust building approaches like collaborative learning, it may be challenging for participants to acquire the level of comfort and candidness necessary for transformative change.

Collaborative learning works best amongst participants who are interested in the subject matter and have a desire to expand their knowledge about it (Sterling, 2011). Therefore, it is important to engage with members of the public who have some interest in learning about food sustainability or are involved in an initiative in-line with this interest. Collaborative learning is well suited to informal education as it allows for the exploration of everyone's ideas and creates an environment where everyone is a student and a teacher. Collaborative learning creates an environment where communities can learn and work together towards their sustainability goals.

## **Interactive learning**

Within informal education settings when teaching physical skills, interactive learning can play an important role. Although many individuals learn by reading and watching, many benefit from physically practicing certain skills in order to commit them to memory. Learning through the act of mimicking is a proven teaching method and is especially successful when it comes to skills that involve creating with or using our hands. Utilising interactive learning in a community education environment also encourages participants to engage with each other and potentially go on to foster relationships outside of the learning environment (Cloud, 2014).

## **Social learning**

Families and communities are the first teachers in our lives. They provide the foundational social education that teaches us how to exist in harmony within the household and local society. We continue to educate each other socially through the performance and perpetuation of social norms. “These social norms are also transported among personal networks of friends, family or neighbours and then shape personal norms that individuals appropriate” (Witzel et al., pp 6467, 2015). These innate behaviours are often the source of resistance when trying to make long-term behavioural changes (Slater and Robinson, 2020). These behaviour norms are implicit knowledge. What is deemed to be socially acceptable behaviour is taught, this same approach applies for sustainable behaviour within households and communities. Sustainable practices are behaviours can be learned and taught. If they are practiced by entire communities, they can become the new social norms.

## **Community Education**

Whilst food sustainability education can be taught by private educators or mentors, running workshops in collaboration with local councils, community gardens or established urban farms is likely to gain more traction. Collaborating with local organisations means courses can be adapted to cover issues that directly impact specific communities or cities. Educating on food sustainability through local organisations aids in changing unsustainable social norms within a community (Laal & Laal, 2012). As individuals learn more about sustainability, this knowledge makes its way into their households continuing the cycle of sustainability education and shifts how households approach their day-to-day lives. Community education provides its members with new skills and knowledge that they can use to live more sustainable lifestyles. Community

education empowers individuals within their communities and allows them to shape the environments they live in. These individuals can contribute positively to their local ecosystem and go on to educate others. Combining food sustainability education with community gardening and urban farming enriches community relationships, resulting in neighbourhoods where individuals are more environmentally aware and actively working towards the betterment of their local areas (Noguchi et al., 2015).

## 5.4 Informal education and social media

Social media has become intrinsically linked with everyday life. Social media applications allow users to exchange self-made content and information (Vanwynsberghe & Verdegem, 2013). Consumers utilise it as a means to communicate with loved ones, to stay abreast of news and as an information resource. While it is omnipresent in daily life, it is not typically viewed as an educational resource. Prior to the pandemic, online learning was associated with platforms like Moodle, that allow students to access institution resources remotely. Online learning became a fixture within education during the pandemic, with real time online classes and interaction with peers on digital platforms. The pandemic forced the integration of online learning into many institutions, whom under normal circumstances would have taken years to implement it. The pandemic “caused compulsory modification in the attitudes of education administrators, instructors and learners on the significance of online learning” (Adedoyin and Soykan, pp 3, 2020). As institutions begin to open their doors to students again, many have opted to keep online learning as a part of their course structure. The shift to online education normalised the idea of online learning for the general public and saw more people taking up courses for their betterment and leisure. Online learning is an ideal learning avenue for adults outside of formal education looking to improve their knowledge on subjects that interest them. Social media applications are not usually perceived to be for educational purposes, however they present an opportunity to take online education into new digital spaces (Gülbahar et al., 2017).

As sustainability and all related subject matter are omnipresent in the zeitgeist, it is important for learning materials and learning opportunities to be present wherever the public are accessing this information the most. Recent studies encourage the production of diverse avenues to increase sustainability awareness, online spaces such as social media and apps for consumer education (BEUC, 2020). The sustainability and awareness study revealed that 40% of respondents utilise social media for information regarding sustainability. Recent studies state that the use of social media in collaborative learning improved students’ performance (Ansari and Khan, 2020). This presents an opportunity for learning resources and courses that are tailored specifically for these digital platforms. The purpose of educating on sustainability is to assist with embedding sustainable behaviours. In-person exchanges, where participants can see a physical example provides a visual learning opportunity and hands-on support to make these sustainable practices more accessible. However, in-person teaching can be limiting and

reaches fewer people. Courses on sustainable practice can be adapted for online platforms and allow learners to take part at any time. These workshops can be designed to teach practical skills and engage the participants in critical thinking regarding sustainable behaviours.

Social media is fast-paced information sharing that allows for numerous options for communication spaces (Gülbahar et al., 2017). It creates communities of individuals based on interests and allows for social networking, collaboration and live communication (Ansari & Khan, 2020). Online learning allows individuals access to resources and people that they may not ordinarily have access to because of their location, schedules or finances. Interactive food sustainability workshops are a medium that would work well on social media platforms. The workshop format, that uses a combination of taught, interactive and collaborative teaching methods can be used to deliver food sustainability courses both in-person and online. A recent study revealed social media can be successfully used for collaborative learning and can improve student engagement (Ansari & Khan, 2020). Workshops designed to allow in-person or digital participation, create great flexibility and access for participants. Workshops allow participants to take part no-matter where they are in the world, whilst still being interactive. They can be designed to include segments where participants converse amongst themselves, or a lecture is delivered in a more traditional style. Workshops can also be made available for offline use, allowing participants to engage at a time that suits them. Utilising social media for education also allows for multi-platform learning, as social media allows people to communicate via multiple methods at once such as text, voice or video chat. The pandemic has resulted in more learning materials being made available on several platforms such as Zoom, Microsoft teams and Facebook spaces (Ansari & Khan, 2020). This is advantageous as it allows for participants to access learning materials on whichever platform they are the most comfortable. It also allows for the grouping of participants who do not live the same area but have the same interests to be put together in virtual classrooms. In instances where participants are in proximity to one another, online learning can then lead to meetings taking place in-person and allows additional learning experiences to take place outside of the workshops.

Social media provides individuals who have an interest in food sustainability to connect with others and build digital communities spaces, these spaces are ideal for facilitating collaborative learning (Ansari and Khan, 2020). Many social media platforms presently have many prominent sustainability activists who provide their following with information and a roadmap on how to live their lives more sustainably. These virtual spaces can also provide a sense of

community to those who belong to groups that are not well represented in their real lives. Using social media as an avenue for education works towards the same end goal of assisting individuals in developing sustainable skills, but does so in a way that has the potential to reach more people. Social media and online spaces are an integral part of society, their use in education is a concept that is gaining traction. Utilising social media for education on food sustainability provides an opportunity to further the agenda of sustainability and foster online sustainability communities.

## **5.5 Summary**

Educating on sustainability can be challenging, as every individual brings with them a unique lived experience and worldview. Although they show concern for the environment, their day-to-day lives take precedence. In order to overcome these factors, educating on sustainability needs to be adaptable and transformative. These are characteristics that are embedded in Education for Sustainability. EfS is an effective holistic approach to education that incorporates social and collaborative learning approaches to foster long-term behavioural change (Cloud, 2014). Utilising EfS approaches within informal education settings provides an opportunity to address public education on food sustainability and encourage community education through local community gardens, food initiatives and urban farms. Educating on food sustainability not only addresses immediate issues, such as household food waste, it provides a substantial introduction to the concepts of sustainable living, improves climate literacy and naturally segues into larger environmental issues. Combining food sustainability education with informal education via social media platforms provides another avenue to educate the public. “Mobile devices and social media provide excellent educational e-learning opportunities to students for academic collaboration, accessing in-course contents and tutors” (Ansari and Khan, pp1, 2020). Online learning also offers students the advantage of flexibility and self-pacing, which are crucial for many adults who are no longer in full-time education (Adedoyin and Soykan, 2020). Whether online or in-person, recent research advocates for educating the public on sustainability for there to be a significant shift in sustainable practice amongst the public (Gülbahar et al., 2017) (Ansari and Khan, 2020) (García-González et al., 2020) (Sterling, 2011). Educating the public on sustainability provides individuals with the agency necessary to collectively build a sustainable future (Weber, 2021).



## **CHAPTER 6: FOOD SUSTAINABILITY & URBAN FARMING**

### **6.1 Overview**

Food waste initiatives can be found at community and government levels (such as the food waste reduction scheme headed by Defra). These initiatives aim to curb food waste and provide the public with useful information and education. Although many initiatives exist and provide informative resource material, they do not provide in-depth ongoing learning experiences or live educational events. Informal education on sustainability can offer members of the public opportunities to educate themselves on the climate crisis and ways in which they can make significant changes to their lifestyles. It can provide education for individuals who are eager to learn more about sustainability or find solutions to their concerns about their impact on the environment. As experiential learning is advisable for lasting behavioural change (Sterling, 2011), educating on sustainability where individuals can gain new skills and knowledge is ideal. Urban farms provide an idyllic learning environment that removes people from their city lives and allows them to learn and engage in a pastoral setting that reconnects them with nature.

### **6.2 Urban development and Urban farming**

With urbanisation continuing to rise, it is essential to develop cities, new and old, with the environment in mind (Nicholls et al., 2020). Within the food sector, food security for current and future generations amidst the escalating environmental crisis is the greatest challenge (Vermeulen et al., 2012). The development of local food producers and a more inclusive agricultural system are listed as action points in section B of policy action agenda for transition to sustainable foods and agriculture (UN Climate change conference, 2021). Producing food in sustainable ways with methods that do not deplete the earth of natural resources is a part of the challenge. There needs to be shift from the established mono-cropping linear production system, to one that prioritizes smaller scale localised production, to ease food industry's impact on the environment (Biel, 2016) (Keivani, 2009). Many factors need to work in tandem in order to maintain a healthy agricultural system. This involves the maintenance of healthy soil fertility, nutrient cycling and pest control (Nicholls, et al., 2020). It is crucial to explore alternative farming practices that can stimulate biodiversity, as biodiversity safeguards crops and allows ecosystems to be adaptive (Biel, 2016). Recent studies estimate that up to 50% of existing green spaces within the United Kingdom's cities have the potential for urban farming

at some level (Walsh et al., 2022), this percentages increases when rooftops and underground spaces are included. Urban farms promote biodiversity by nurturing habitats flora and fauna (Nicholls, 2020). Creating community environments where food growing is a part of the social norm is a beneficial choice for cities in many ways and aids in the preservation of local ecosystems.

Urban agriculture is the production of food within urban areas, this also includes the rearing of animals. This can be via edible landscaping, rooftop gardening, community gardens or allotment farming (Nicholls, 2020). Home gardening also falls into this category however, it is most commonly families growing food for their personal consumption. Urban farming has many benefits aside from creating biodiversity in urban areas. It provides societal benefits such as education, community building and financial growth. It can also contribute towards feeding the community, aiding in gaining food security and improving the health of community members. This holistic approach to urban farming that benefits communities and the environment can be seen in several international projects. An urban farming project in Belo Horizonte (Brazil), showcases the potential of urban farming to reduce the impact of food transportation on the environment (Oliveira et al., 2021). The project compared the transportation of butter lettuce via tradition food supply routes and local urban farms selling directly to consumers. The project found that, reducing the distance between consumers and fresh produce in turn reduced food miles by 68%, reduced diesel usage by 81% and resulted in an overall reduced dependency on vehicles for food security in urban areas (Oliveira et al., 2021). On delivery of fresh produce, the farms collect food waste material to be composted and reused on the farm. This circular approach to farming ensures that food waste is recycled appropriately and contributes towards the production of future crops.

In Oslo (Norway), municipalities have recently begun supporting urban farms to encourage their development under the “Sprouting Oslo” project (Gustavsen et al., 2022). The farms are used for commercial, educational and recreational purposes, engaging different demographics of the community. The Sprouting Oslo project aims to educate the public on local food production and nurture sustainable urban development (Gustavsen et al., 2022). The SATURN project that took place in Trento (Italy) sought to utilise abandoned land for urban farming or community gardens (Nikologianni et al., 2022). Abandoned land was leased to farmers, to support urban farming development and re-integrate food production into city life (Nikologianni et al., 2022). Much like the project in Belo Horizonte, it reduced the distance

between consumers and food production. The SATURN project also started an urban farm in Birmingham (United Kingdom). Unlike the urban farm in Trento, the Birmingham farm focuses on urban farming as a therapeutic avenue. This farm is used to build the community, relief stress and improve the mental health of its participants (Nikologianni et al., 2022). These projects showcase that urban farms can be versatile and beneficial to all those who participate. They have the potential to reinvigorate abandoned land, reduce emissions, whilst feeding and strengthening communities.

The rapid rate of urbanisation and large-scale food production are two notable reasons for governments to begin supporting urban farming options (Walsh et al., 2022). In order for urban farming to be a successful strategy for cities, attitudes towards land use have to change. As an alternative to forgoing large plots of land to industrial farming, farming needs to be considered as a part of the societal fabric. It is important for urban farming to be a part of policy, in order to ensure that city developers are embedding a culture of community growing into buildings and cities. Smaller scale farming in and around urban areas is becoming a strong contender for tackling food production and reintegrating the culture of farming back into city life. Instead of viewing agriculture and urbanisation as competitors for land use, land within urban areas should be viewed as multifunctional (Keivani, 2009) (Nicholls, 2020). As beneficial as urban farming can be for local communities and ecosystems, there is little data on its long-term financial viability. A 2017 UK study found that several small organic farms were able to match the production output of some local industrial farms, however more studies examining this are needed (Nicholls, 2020). Although urban farming is more labour intensive, the majority of urban farms produce organic food and utilise fewer chemicals (Walsh et al., 2022). Not only can urban farming improve access to nutritious produce within communities, it improves the mental and physical health of those who take part in it (Biel, 2016). Urban farms can be built to incorporate recreational areas, increasing the communal green spaces within a community (Nicholls, 2020). Although there is great potential for growing food indoors or underground using specialised techniques like vertical farming, urban farming is more accessible to the general public and requires fewer resources, knowledge and energy to get started (Walsh et al., 2022).

The act of urban farming has radical effects on individuals and their surroundings. It can educate and reconnect people with food production, it can also be a vehicle for great social change. “It would be ludicrous to think that a revolution of such magnitude could be radical

merely in a technical sense, without being also socially radical.” (Biel, pp2, 2016). As the social ecology transforms, this impacts the political and economic components of a society. Although urban farming could be an effective development towards more sustainable cities, it cannot succeed without educating and encouraging more individuals to participate. If supported by governments, urban farming can provide a viable solution towards overhauling the current food system.

Urban farming initiatives have the potential to transform local food systems, providing both individuals and businesses with fresh produce. They are spaces that encourage lifelong learning, skills development and they can provide employment or a fulfilling pastime for residents. By providing informal education through food initiatives and community gardens, individuals can explore new ways to feed themselves and their communities (Biel, 2016). The COVID-19 pandemic has highlighted how susceptible the global food system is to shocks and how dependent countries like the United Kingdom are on imported foods (Walsh et al., 2022). Urban farming not only opens an avenue for food security for local communities, but it has the potential to contribute towards national food sovereignty, by providing a complementary food supply chain to existing ones. Urban farming also aligns with many of the SDG’s. Conducting food sustainability education within communities creates environments where more individuals can learn about sustainability and making sustainable food practices more accessible. Community food growing connects people with the food system, each other and allows them to be active participants in food production.

Three of the main challenges to sustainability within urban cities are urbanisation, rapid growth and globalisation (Keivani, 2009). As factors such as migration and economic development continue to grow cities, their contribution towards environmental issues grows as well. Cities are the hubs of manufacture and consumption. They simultaneously consume the majority of the world’s resources, whilst producing the majority of the world’s greenhouse gases (Walsh et al., 2022). Although urban cities are having a significant detrimental impact on the environment, they are also hubs for social and cultural exchange. They are the heart of knowledge exchange, transformation and creativity, all of which can contribute greatly to developing sustainable practice amongst the general public. “Cities provide the greatest promise and potential for addressing many challenges. The same concentrations of people that underlie the challenges also provide the agglomeration economies for more efficient use of

resources and provision of services and the space for greater innovation and productivity.” (Keivani, pp13, 2009).

Urban farms have the potential to make an impact beyond their local communities. Urban agriculture addresses several of the SDG’s. Urban farming contributes towards building more sustainable cities and communities (SDG 11), It encourages responsible consumption and production (SDG 12), it aids cities in taking action against climate change (SDG 13) and it contributes towards stopping the loss of biodiversity (SDG 15) (United Nations, 2022). If the urban farms work with members of their community through creating employment of encouraging community members to participate in urban farming, it can generate income and a local food source for members of the community, alleviating poverty (SDG 1). Food initiatives and community gardens can collaborate with local organisations and authorities to create networks that feed the community or individuals in need, lowering the risk of people going hungry (SDG 2) (United Nations, 2022). As SDG 2 targets sustainable agriculture, it also advocates for empowering small-scale farmers (United Nations, 2022b)

Although urban agriculture tends to be on a significantly smaller scale than industrial farming, it provides its surrounding communities with a shorter supply chain (Walsh et al., 2022) (Nicholls, 2020). As a result, fresh locally produced foods become more accessible. The environmental and economic costs of transporting foods long distances are also reduced. This creates a local economic ecosystem where, “local is the new global” (WEF Report, 2017). Urban agriculture also utilises practices such as integrated farming, aquaponics and regenerative farming. Using a variety of environmentally responsible farming practices within urban settings can provide small-scale examples of ways in which food industry can innovate and begin the process of restructuring the way the existing food system operates.

Access to nutritious healthy foods is not solely an issue of distribution difficulties, but rather food insecurity is an injustice rooted in historical, political and economic inequalities (Biel, 2016). Phenomena such as food deserts exist because of a lack of access to nutritious food, in impoverished urban areas. This type of malnutrition “is not caused by deficient production per se, but by a deficit of entitlements” (Biel, pp6, 2016). Urban farming is not just a great avenue for community growing, it can be beneficial for private households. The use of a variety of agroecological methods means that urban farming can be practiced in large or small spaces and is adaptable. Families with access to small gardens, balconies or allotments can participate in

urban farming for their personal use and in some instances, for a source of income. Urban gardening within households can also provide a source of healthy food, which is not always accessible for families living in food deserts or areas where there is limited access to fresh produce. As there is a shorter supply chain between producers and consumers, the nutritional content of locally grown produce can be higher, however further studies are needed to confirm this (Walsh et al., 2022).

For urban farming to be a viable option, there needs to be interest within communities and support from local authorities and government. Mentors and community groups with an interest in urban farming exist and are a valuable source of knowledge and skills that is underutilised. Public green spaces are an avenue for urban agriculture that holds vast potential. With the collaboration of urban farming initiatives, local councils and community members there are opportunities to begin building small-scale food production projects, that could greatly benefit communities. “With allotments and community gardens already supporting a network of committed and knowledgeable gardeners, a rich source of knowledge and skills is already present in urban areas which can be leveraged to provide technical support to other members of the public, as a way of encouraging engagement in urban growing.” (Walsh et al., pp 11, 2022). Utilising urban farms as a teaching space for food sustainability creates many opportunities for participants to interact with food and nature in ways they may not ordinarily. This environment opens the door to experiential learning that can foster the relationship between people, food systems and the planet. Teaching food sustainability education in collaboration with urban farms provides a comfortable learning environment full of new and interesting experiences.

### **6.3 Case study 1 - Kentish Town City Farm**

Kentish Town City Farm (KTCF) is one of London's oldest urban farms and was established in 1972 (Kentish Town City Farm, 2013). The farm is a local charity that provides several outdoor and farming experiences to help people within the community reconnect with nature. Aside from animal pastures, the 4-acre farm also features a community-run garden that is maintained by volunteers. They pride themselves on inclusiveness, creating a welcoming environment for all members of their community.

KTCF provide several learning experiences, targeted at young children in primary school. The farm runs 6 educational programs including a work experience program. The work experience program hosts up to 100 students each year, providing an introduction to animal husbandry (Kentish Town City Farm, 2022). They run a Young Farmers Club, available to local children, providing first-hand experience looking after animals and assisting during seasonal festivals (Kentish Town City Farm, 2013). Along with their Young Farmers Club, they provide vocational activities such as therapeutic horse riding and educational class trips (Kentish Town City Farm, 2013). These class learning experiences aim to teach children about farm life, caring for animals and how to grow food. These school daytrips can be tailored to include topics that the class is currently studying, making it a practical learning experience (Kentish Town City Farm, 2013). These classes combine neo-classical and liberal approaches towards education. The educator is a mentor within an open learning environment, where students are able to discover and investigate as part of their learning. During these sessions, students explore the interdependency of plants and animals, how animals adapt to the environment and how all these components of nature work in symbiosis to nurture and feed one another. Human influence is also explored, in order for the students to identify the ways in which people can help or harm nature. Whilst targeted at children, many features of the Early Years and Foundations programs could be beneficial for adults. KTCF already has templates in place for educating on farming and sustainable practice, expanding on their existing courses to develop workshops for adults is attainable. Notable components of their existing courses that can be incorporated into an adult workshop are the vegetable growing and seasonal harvesting class.

At present, adults can assist on the farm as volunteers (privately or as a corporate function). The farm hosts up to 50 volunteers a month, which includes long term volunteers and once off team building days (Kentish Town City Farm, 2022). Volunteering involves assisting with the children's class trips, administration or working with the riding staff (Kentish Town City Farm,

2013). As KTCF encourages participation from community members, it would be an idyllic venue to offer informal education on food sustainability for adults. Their farming environment provides the perfect landscape to learn about small-scale food growing and home composting. The farms facilities include fruit and vegetable gardens. These could provide an excellent learning space for education on growing produce, food storage, food preservation techniques.

As KTCF are always in need of volunteers, community members could assist with this, whilst learning valuable skills. KTCF recently hosted a Repair Reuse & Recycle workshop in collaboration with the council. This involved a workshop on how to revive and repurpose old items of clothing, in order to reduce fashion waste. Similar events can be developed for food sustainability and food waste. To encourage continued engagement and participation on the farm, once-off workshops could also offer the option of a weekly grower's club, where participants could return to assist with farm activities and tend dedicated plots.



## 6.4 Case study 2 - Sunnyside Community Gardens

Sunnyside community gardens provides an outdoor recreational space for individuals living within north London. Onsite they provide therapeutic gardening experiences, with a focus on individuals living with disabilities or in recovery (Sunnyside Community Gardens, 2022). The garden is maintained by local residents, who volunteer on an ongoing basis or as a once-off activity. In 2020, the gardens had 88 active volunteers, who volunteered for a total for 727 days. As a volunteer, participants gain skills and knowledge on gardening and wildlife conservation, whilst building relationships with other members of the surrounding community. Volunteers also assist with selling the plants grown within the garden, generating funds to help maintain the gardens and its employees. Much like Kentish Town City Farm, Sunnyside community garden accept corporate volunteers. Sunnyside community gardens are dependent on corporate volunteer groups to assist with larger projects that the permanent staff and local volunteers cannot complete on themselves (Sunnyside Community Gardens, 2022). Amongst its experiential learning sessions, Sunnyside community garden provide a ‘Cook and Grow’ workshop once a week. The “Cook and Grow” workshop has been running since 2018. Cook and Grow is targeted at adults aged between 20 and 60, 4-6 individuals attend the weekly sessions (Sunnyside Community Gardens, 2022). Participants are often referred to the workshop by their doctors or residential facilities, as many of them struggle with their mental health or food insecurity (Sunnyside Community Gardens, 2022). The cook and grow workshop aims to create a comforting space, where participants can enjoy a relaxed learning environment, then cook and eat a meal together. The day is intended to be therapeutic, creating a safe and enjoyable experience for its participants. The session is light and provides basic information on growing a small food garden and how these ingredients can be cooked and used in everyday meals. The Cook and Grow workshop is popular amongst attendees and requires booking in advance, showing that there is a demand on education in the realm of sustainable food practices. This session is an ideal starting point for individuals who have an express interest in gardening and growing food. This concept could be taken further, by including subjects such as climate change, food sustainability and food waste management. It is the perfect opportunity to connect the act of growing food to larger environmental issues and highlighting the benefits of growing food for one’s health, community and the planet. The cooking portion of this workshop could also become more in-depth by including subjects such as food preservation, food storage and food waste management techniques like composting.

In the early months of the pandemic, Sunnyside community gardens ran their ‘Garden in your flat’ campaign. The “Garden in your flat” campaign began as a way for the Sunnyside volunteers to keep busy during a pandemic lockdown. As the lockdowns continued, they put together growing kits for their community gardeners to encourage growing at home. Their initiative gained popularity amongst regular patrons of the garden, who began requesting growing kits. Sunflower seeds were sent out to residents to begin as seedlings in their homes, these were then brought back to the community garden and planted during the summer (Sunnyside Community Gardens, 2022). Over 100 sunflowers came back and were planted around the community garden.

The “Garden in your flat” initiative has been success in encouraging individuals to give gardening a try, regardless of how small their outdoor space is. This initiative has kept going since the pandemic and has begun to distribute a wider variety of seeds, including food seeds for residents to grow and keep such as peppers, carrots and chillies. The Garden in your flat’ campaign encouraged residents to reconnect with nature, during a trying time. It also started a movement of growing plants for a communal space and encouraged individuals to be a part of the ongoing process of maintaining plant diversity in their local ecological system. The garden in your flat campaign has great social media potential and could be used to connect home growers and develop an online community. This online community space could be used to host food sustainability workshops.

## 6.5 Summary

There needs to be shift from linear food production to an assortment of circular small-scale regenerative production methods. Urban farming is an avenue that can support small scale farming whilst nurturing local ecosystems. Presently, community gardens and urban farms account for only 1% of national agricultural land (Walsh et al., 2022). There is vast opportunity for its implementation in existing public green spaces and buildings. It is paramount that urban farming be considered in new and developing cities for it to be integrated in everyday life, this would see growing spaces being part of new builds in future. Urban farming provides many benefits with communities. Aside from increasing the number of green spaces it provides community members with environments where they can learn. Urban farming provides an opportunity to integrate traditional and modern farming knowledge on small scales that can support local communities, improve biodiversity and improve social community dynamics. Urban farming creates bonds within communities and reconnect people with where their food comes from. It has the potential to provide local communities with food, employment and new skills. At present, there is insufficient data regarding the intricacies of a food system that integrates and relies on urban farming. However, it is a subject that is gaining momentum and the studies that support its implementation highlight it's potential. It's potential for being a long-term food production system and how this would work requires further case studies and formal data (Walsh et al., 2022). At the very least, it can contribute positively to communities by providing food security, employment, education and improved health (Nicholls, 2020).

## **CHAPTER 7: FOOD SUSTAINABILITY & SUSTAINABILITY AWARENESS STUDY**

### **7.1 Overview**

This section details the results of the Food Sustainability and Awareness survey that was conducted during this study. 107 individuals participated in the study, the majority being UK residents and LSBU students located in England. The results showcase that the majority (55%) believed themselves to have a basic understanding of what food sustainability is, however, a similar percentage admitted to throwing away food at least once a week. Participants also expressed a feeling of responsibility to be more sustainable within their day-to-day lives and overwhelmingly expressed a desire to learn more about food sustainability.

### **7.2 Introduction**

The Food Sustainability and Sustainability Awareness study began on the 30<sup>th</sup> March 2021 following ethics approval. The purpose of the survey was to:

- i. Identify the public's attitudes and understanding of food sustainability
- ii. Identify behaviours surrounding household food waste
- iii. Gauge feelings on responsibility towards sustainable behaviour
- iv. Gauge public desire for education on food sustainability and climate change

It also aimed to gain insight into the factors, such as shopping habits within households that contribute to food waste. The survey ran for a period of 8 weeks on and off. It was initially intended to run for a two-week period however, a sufficient pool of results was not achieved during that time. The survey began during a COVID-19 lockdown period, which limited channels of promotion. The survey was re-opened as restrictions began to loosen, in efforts to obtain more responses. As many factors impact the amount of food waste a household generates, efforts were made to obtain data from a wide participant pool. The questionnaire was open to the general public and some targeted promotion was made towards LSBU students. The survey was distributed via email link and was promoted in the student communication newsletter twice. Students and the general public were asked to participate to gauge to their current understanding of sustainability, and what platforms the general public engage with to

find information about sustainability. Identifying where people obtain information about sustainability provides insight into what kind of educational resources they are most likely to engage with. A critical question within this survey regarded whether participants had a desire to learn more about food sustainability and what exactly their interests were. The two most requested areas of education were on how to avoid food waste (65.2%), information on food and climate change (81.1%).

### **7.3 Methodology (Survey Development)**

In preparation for the development of this survey, several existing food sustainability surveys and reports were used as a template. This preliminary research was done in order to gain an understanding of the format of a survey and to identify existing concerns in relation to consumer food sustainability. Namely Van Herpen's study on "validating food waste in households" (Herpen et al., 2019), the FDF Food Waste Survey (2015) and the WRAP food waste trends surveys (2019) (2021). A book that greatly influenced the development of questions and the style of questions included was Questionnaire Design, by Ian Brace (2013). In order to collect meaningful data, the questions and the question order had to be designed accurately. The majority of the questions are quantitative and produced quantifiable data. The final section contained several qualitative questions, exploratory questions to gain insight into the participants ideology and approach to sustainable living. The question sections were designed around the main objectives of the overall research.

The questionnaire took roughly 15-20 minutes to complete, dependant on how in-depth the participant chose to answer. The questions were formulated to be easy to answer, as research shows questionnaires that are challenging or time consuming yield lower results (Brace, 2013). According to existing surveys, participants tend to lose interest around the 30-minute mark (Brace, 2013) (Herpen et al., 2019). Efforts were made to vary the type of questions, as when the same type of question is asked, participants will adopt a patterned response. Researchers and survey developers alike agree that reducing the participants "burden" whilst taking the survey is imperative, in order to encourage as many completed submissions as possible (Brace, 2013) (Herpen et al., 2019). Should a survey be perceived to be too challenging, fewer respondents are likely to complete it or submit data that is beneficial. Poorly designed lengthy questionnaires result in participants dropping out before submission and not completing the survey in full. Developing a short and engaging survey was the goal, as respondents tend to contradict themselves if the survey is too long.

The sequence of questions in relation to one another and sequence of sections to one another, were both deeply considered as they greatly impact the participants responses. The demographic questions were placed last, as these require the least amount of focus from the participants, as these are factual details about themselves and do not require their opinion. Questions were ordered from most broad to the most targeted questions. This allows for the questions to be planned logically and graduate from behavioural questions to those based on the participants opinion, this was done to avoid participants given opinions on the subject that were not well thought out. (Brace, 2013). Questions regarding personal and classification information have been placed at the end of the survey, as at this stage they are likely to feel less intrusive. In designing the questionnaire, it was important to ensure that participants could only view the questions that were applicable to them. A ‘drop-leaf’ question system was used, so further questions would only appear if certain primary answers were given. If participants realise that certain answers will require more information, they may give false response to save time, this system was used to further reduce the “respondent burden” was relatively low (Herpen et al., 2019).

As the questionnaire was seeking data on both behaviour and attitudes relating to food sustainability, it contained a mix of open ended and closed questions. The responses to the open ended questions have been grouped or ‘coded’ based on similar themes and opinion (Brace, 2013). As the open-ended questions were seeking a spontaneous answer based on opinion, they were left to the end of the survey. Open ended questions were also used to gauge the participants level of understanding on the subject of food sustainability. 73% of respondents answered the open-ended questions, a lowered response rate was expected. As the questions were placed towards the end of the questionnaire and respondents answer rates of spontaneous questions depend on their interest level in the subject, 100% response rate was not anticipated (Brace, 2013). Another obstacle which was faced as the result of using open ended questions was that some participants misunderstood the question and as a result their answers were not valid. Although open ended questions did provide great insight into the opinions of the participants, analysing the responses was challenging, so these questions were kept to a minimum. The majority of the survey consisted of pre-coded closed questions, that required the participant to select an answer that most directly depicted their behaviour. On several questions, ‘I don’t know/Prefer not to say’ responses were included as answer options in order to avoid participants opting out of the survey early or selecting a random answer to complete the survey. Although these can serve as a legitimate answer, they can also provide the

participant with an option that does not require them to answer honestly, so whilst useful, they were kept to a minimum (Brace, 2013). Behaviour questions were asked in the beginning of the questionnaire, as they are easier to answer and there is a lower risk of participants terminating the questionnaire early. As the behaviour questions provided the majority of quantifiable data, they were asked first in order to avoid bias caused by their answers to the previous questions (Brace, 2013). Efforts were made to develop questions that were neutral and concise in order to generate useable data. The question sections were order in such a way as to avoid answer prompting and order bias (Brace, 2013). The survey was kept to under 30 questions, in order to avoid fatigue.

As the survey relied on the participants to recall their past behaviour, specific quantities and details are not guaranteed. The responses reflect what the participants believe their behaviour to be. It can also be inaccurate if participants do not want to disclose true information or if it is not something they pay a great deal of attention to. Future studies related to this work will consider techniques such as written reporting in a diary over a specific period of time.

Given that a COVID-19 stay-at-home order was taking place at the time of this primary research, an online survey was the best option. An online survey also provided the benefit of anonymity. The online survey also utilised a routing question system, that would not have been possible with a physical paper survey.

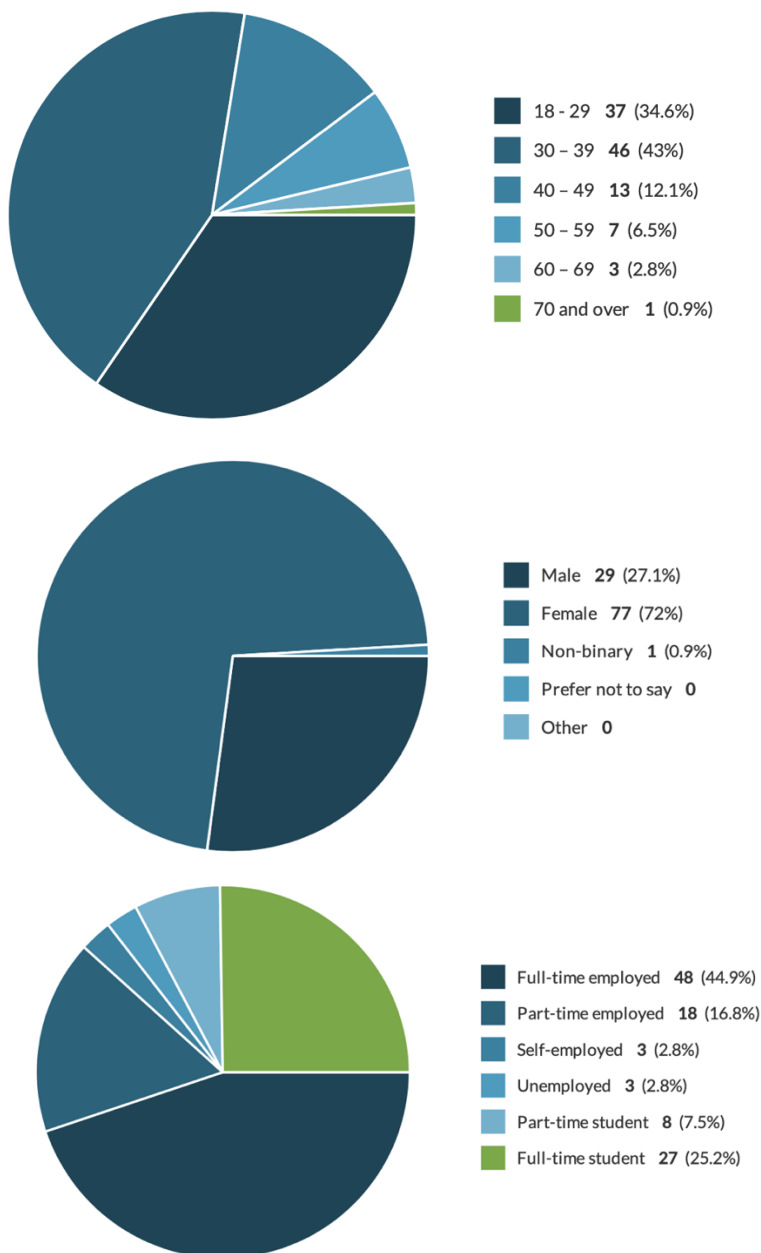
## 7.4 Results

Household food waste does not occur in a vacuum, other daily practices are interlinked with it. Food related behaviours and household food practices are known to be reliable predictors of food waste (Schanes et al., 2018) (WRAP, 2019). It is for this reason that this survey examines the household behaviours surrounding food, cooking and shopping, as well as the respondent's awareness of food sustainability. The results of this survey show that the majority of respondents do have a basic understanding of sustainability and an eagerness to learn more about food sustainability and climate change. Although there is an express desire to be more sustainable, most households throw away food waste at least once per week. Most households occasionally consider prioritising locally grown food and seasonal produce when shopping for food. The vast majority gain their information about sustainability from books, articles and the news.

The lack of knowledge and sustainable practice is evidenced by the high levels of food waste and disregard for sustainable behaviours such as meal planning. 40% of respondents felt a strong responsibility towards climate change and improving the current environmental crisis, 34% said they feel that it is a group effort, and the majority of responsibility falls on governments.



### 7.4.1 Demographics



**Figure 7:** Participant’s age groups, gender and employment status

The questions regarding a participant’s demographic are used to gain insight into societal, economic and cultural factors that can potentially influence attitudes and actions in relation to sustainability. The majority of respondents were between the ages of 30 – 39 years old. 72% of all respondents identify as female and 72% of respondents are responsible for cooking and grocery shopping within their household. Only 10.2% of all respondents were over the age of 50. The majority of participants (64.5%) were either currently in fulltime or parttime

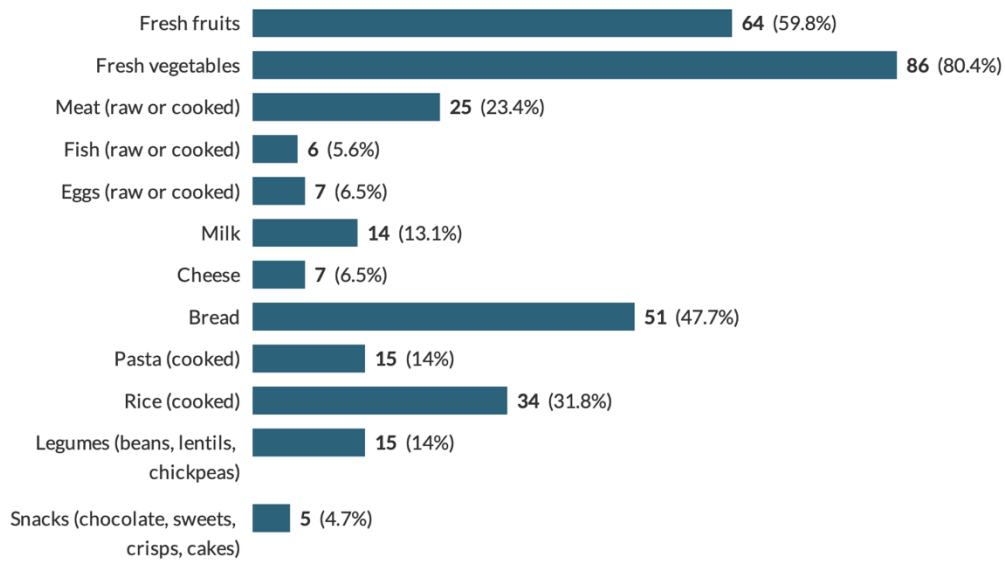
employment. 29.7% were students, 54% of whom study at London South Bank University. The vast majority of participants are currently or have previously been in higher education.

#### 7.4.2 Food Waste Behaviour

**Table 2:** Food shopping and waste behaviour

How often does your household throw away food in a month?	How often does your household shop for food? (Please tick)				No answer	Totals
	Every 1 to 3 days	Once a week	Every two weeks	Once a month		
<b>Everyday</b>	0.93%	4.67%	0.00%	0.00%	0.00%	5.61%
<b>2-4 times a week</b>	2.80%	6.54%	1.87%	0.00%	0.00%	11.21%
<b>Once a week</b>	15.89%	35.51%	0.93%	0.93%	0.00%	53.27%
<b>Every two weeks</b>	2.80%	8.41%	0.00%	0.00%	0.00%	11.21%
<b>Almost never</b>	5.61%	12.15%	0.93%	0.00%	0.00%	18.69%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>28.04%</b>	<b>67.29%</b>	<b>3.74%</b>	<b>0.93%</b>	<b>0.00%</b>	<b>100.00%</b>

57.94% of respondents do the shopping and cooking within their households themselves. Of the participants who do the cooking in their homes, 31% consider themselves to be skilled cooks who enjoy cooking. 67% of participants shop weekly for food, the second largest proportion (28%) shop every 1 to 3 days. These two groups accounted for the households that threw away food the most often, which was once a week. Households of 4 members were the most reported overall at 28.04%, this was followed by 3 member households (26.17%) and 2 member households (24.3%). Of the households who shop weekly for food, 32% were households of 4 members.

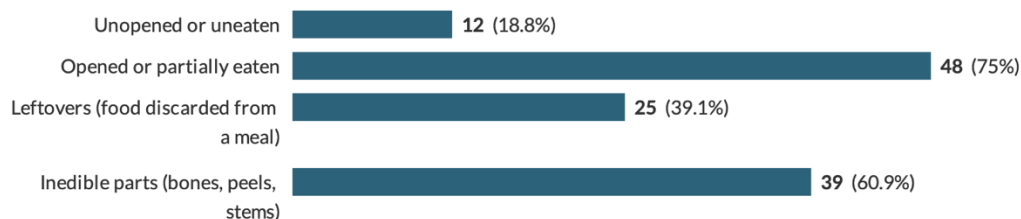


**Figure 8:** Food items thrown away in the last month

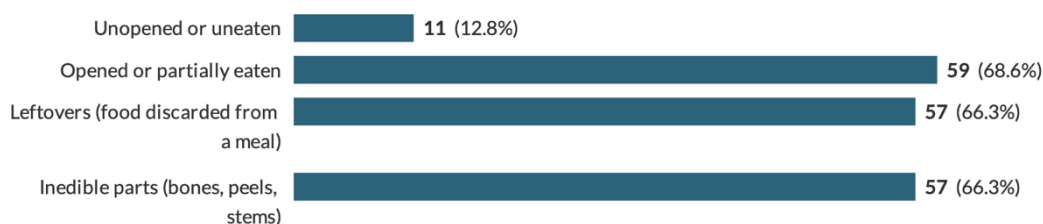
The “validating food waste in households” survey was designed to obtain accurate data relating to the amount of household food waste within the space of a week (Herpen et al., 2019). Conducting the study by requesting participants record specific amounts removes the many complications associated with self-reporting studies (Herpen et al., 2019). Although obtaining a metric measurement of waste is valuable, it did not match the desired data sought in this study. This survey used a similar question outline to record the frequency of which an item was disposed of and what state the food item was in. This allowed for a more detailed account of what stage of consumption the food items were thrown away and what state those items were in. Asking this question in this way allows insight into where mitigating steps can be taken to avoid food waste happening at all stages. When formulating these questions, efforts were made to convey food waste in a neutral manner, to reduce the effects of bias, conducting the survey anonymously also contributes to this (Herpen et al., 2019).

53.3% of households throw away food at least once a week, a further 11.2% throw away food 2 to 4 times a week. 5.6% of respondents admitted to throwing away food on a daily basis. Of the households that throw away food once a week, 39.25% eat an omnivore diet. The foods that were thrown away the most were fruits, vegetables, bread and rice.

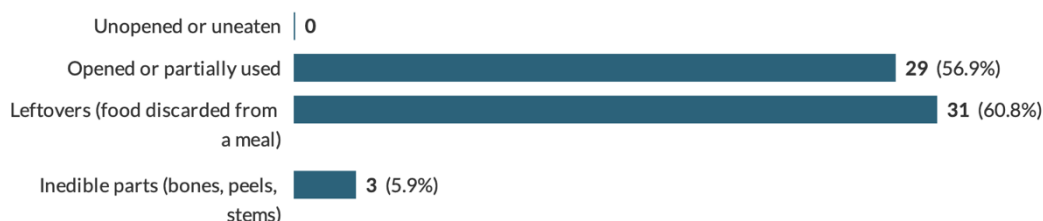
What state were the Fresh Fruits in when you threw them away this past month?



What state were the Fresh vegetable in when you threw them away in the past month?



What state was the Bread in when you threw them away in the past month?

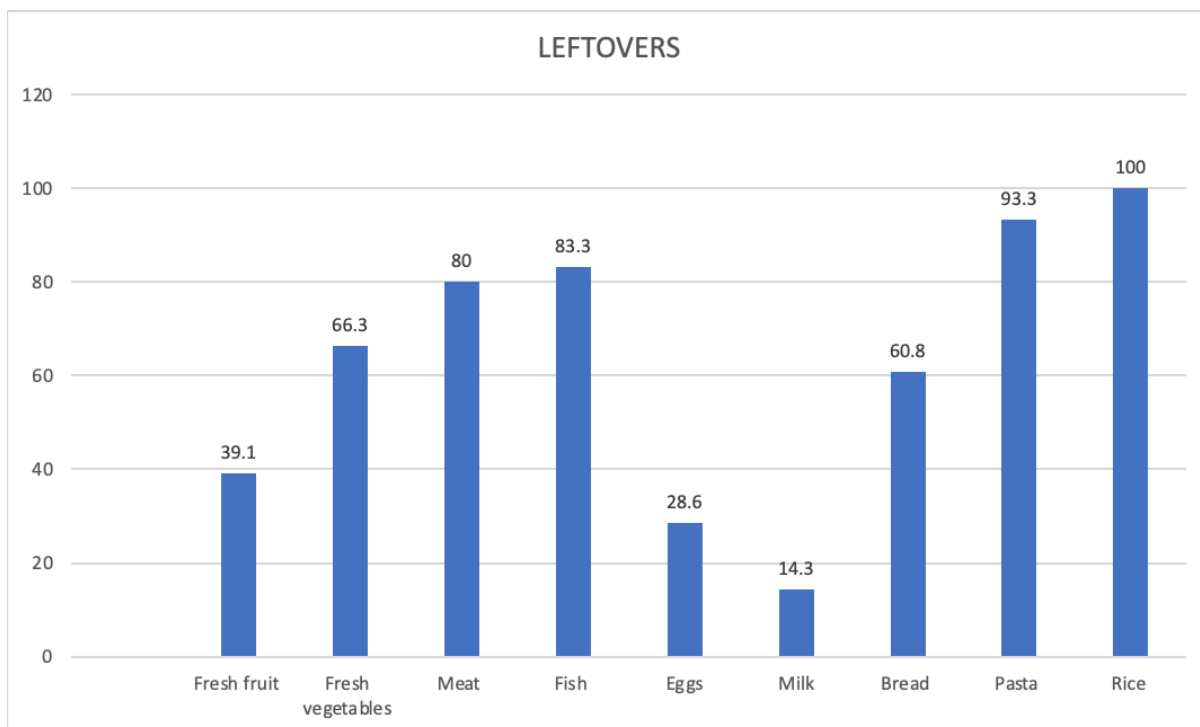


What state was the Rice in when you threw them away in the past month?



**Figure 9:** State of food items when thrown away

Of the most discarded food items, fruits and vegetables were the highest ranking. These were also the two ingredients most reported to be thrown away unused or unopened. 75% of respondents threw away fresh fruits opened or partially eaten, 68.6% threw away fresh vegetables opened or partially eaten.



**Figure 10:** Top foods thrown away as leftovers

Vegetables were thrown away frequently as leftovers from meals at 66.3%. 80% of responses stated they threw away meat and fish as leftovers from meals. Waste from inedible parts such as bones was high for meat (72%) and fish (50%). Bread was thrown away most frequently as a leftover from meals, or when partially used. Rice was thrown away solely as leftovers from meals. The items that were discarded the least were fish, eggs, cheese and snacks. Cheese was thrown away predominantly partially used. Shelf stable sweets and savoury snacks were the least reported items, those that were thrown away were partially eaten.

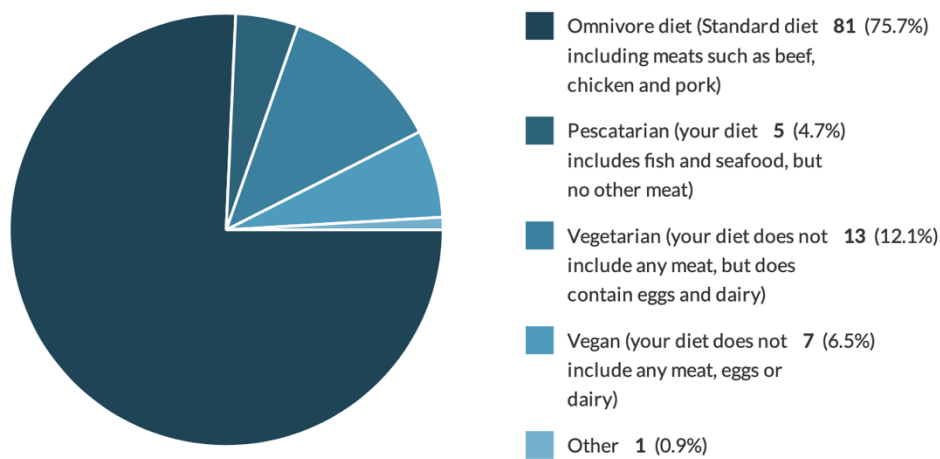
**Table 3: Reasoning behind itemised food waste**

What are the main reasons you throw away food? (you can tick more than one)	Which of the following food items have you thrown away in the last month? (You may tick more than one)												No answer	Totals
	Fresh fruits	Fresh vegetables	Meat (raw or cooked)	Fish (raw or cooked)	Eggs (raw or cooked)	Milk	Cheese	Bread	Pasta (cooked)	Rice (cooked)	Legumes (beans, lentils, chickpeas)	Snacks (chocolate, sweets, crisps, cakes)		
The product is past its 'best before' date	1.79%	2.08%	1.04%	0.15%	0.30%	0.15%	0.45%	2.08%	0.30%	0.15%	0.30%	0.45%	0.00%	9.23%
The product is past its 'use by' date	5.80%	8.33%	2.98%	0.74%	0.89%	1.64%	0.89%	5.21%	1.19%	3.42%	1.64%	0.45%	0.00%	33.18%
I buy too much	3.42%	4.02%	0.74%	0.15%	0.15%	0.89%	0.15%	1.93%	0.74%	1.49%	0.45%	0.00%	0.00%	14.14%
I cook too large a portion	2.98%	4.02%	1.19%	0.45%	0.15%	0.60%	0.60%	2.68%	1.64%	3.12%	1.34%	0.15%	0.00%	18.90%
I find the date labels confusing (sell by/use by/best before)	0.60%	0.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	0.15%	0.15%	0.00%	0.00%	1.64%
I never know what to cook	0.30%	0.45%	0.00%	0.00%	0.15%	0.00%	0.00%	0.15%	0.00%	0.30%	0.15%	0.00%	0.00%	1.49%
I do not plan my meals	1.93%	1.64%	0.60%	0.15%	0.00%	0.00%	0.30%	1.04%	0.30%	0.60%	0.30%	0.00%	0.00%	6.85%
I eat out/order in frequently	1.49%	1.79%	0.60%	0.30%	0.00%	0.30%	0.15%	0.89%	0.15%	0.74%	0.45%	0.00%	0.00%	6.85%
Other	1.64%	2.23%	0.74%	0.00%	0.15%	0.15%	0.00%	1.34%	0.15%	0.74%	0.60%	0.00%	0.00%	7.74%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>19.94%</b>	<b>25.15%</b>	<b>7.89%</b>	<b>1.93%</b>	<b>1.79%</b>	<b>3.72%</b>	<b>2.53%</b>	<b>15.33%</b>	<b>4.61%</b>	<b>10.71%</b>	<b>5.36%</b>	<b>1.04%</b>	<b>0.00%</b>	<b>100.00%</b>

The three main reported reasons for throwing away food were: it had passed its ‘use by’ date (33.18%), they had cooked too large a portion (18.9%) and they had bought too much (14.1%). 6.85% of participants stated that they did not plan their meals and ate out frequently. Of the 45% of respondents who threw away fresh fruits and vegetables most frequently, 14.1% stated their main reason for throwing food away was that the product had passed its ‘use by’ date. Preparing too large a portion and buying too much were the next highly reported answers in relation to fresh fruits and vegetables at 7% and 7.4%. The majority of households who overshopped or cooked too large a portion were households of 3-4 members. When asked whether they checked what ingredients they needed or prepared a list before shopping, 48.6% said they always did. 58% of those who prepared a list before shopping also stated they sometimes purchased items they had not planned to buy, as they were on sale. 17.5% stated they always bought sale items. Amongst the participants who always purchased sale items, the main reasons for throwing food away were products being past their ‘use by’ date (30%) and buying too much (18%). Participants who sometimes purchased sale items had similar results. 10.5% of

respondents selected “other” and elaborated on their response, 76% of these responses stated that fresh fruits and vegetables spoiled quickly once open. 19% stated that they threw away leftovers from meals or leftovers that had been in the fridge too long. 47% of participants said they prepared a list and checked what items were needed before shopping. Comparably ,47% stated they prepared a list sometimes. Of the participants who indicated they always prepare a list, the main reason for throwing away food was it being past it’s use by date (19%), the next highest reported reason was buying too much (7%). Although 47% confirmed that they prepared shopping lists, almost 50% stated they always make unplanned purchases.

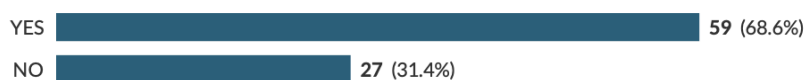
### 7.4.3 Diet and Attitudes towards Food



**Figure 11:** Respondents current diet

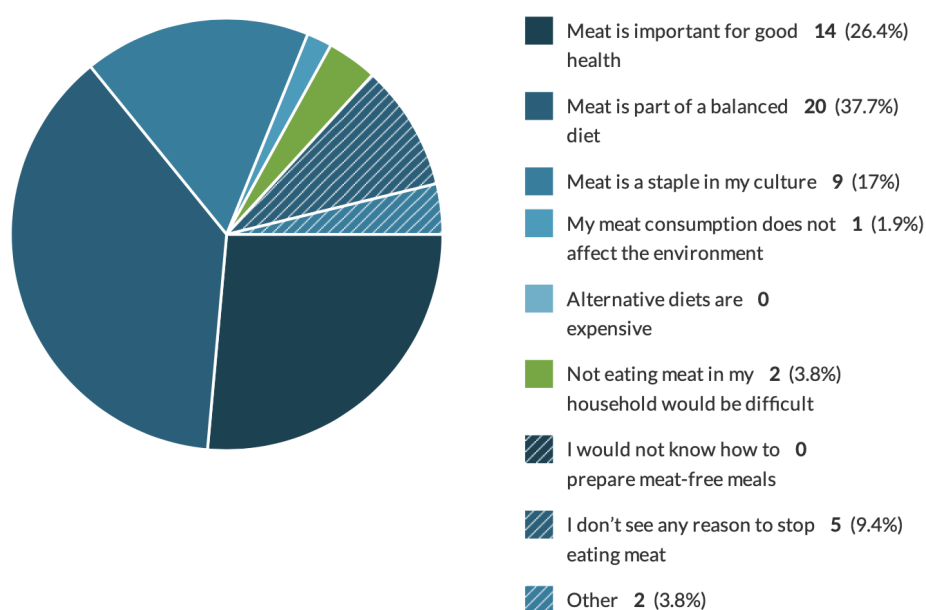
75.7% of participants in the survey eat an omnivore diet. The second largest diet demographic was vegetarians, who made up 12.1% of the results. Of the participants who identify as a vegan or vegetarian , 65% were under the age of 30. None of the participants over the age of 40 practice a vegan diet. Amongst male participants, 82% ate an omnivore diet, whilst 17% were either vegetarian or pescatarian. None of the male respondents identified as vegan. Amongst female participants, 86% ate an omnivore diet, 24% ate an alternative diet. Amongst participants who consumed a vegetarian diet, 38% were white, 30% were of Indian or Pakistani descent and 15% were of mixed ethnic background.

If you do eat meat, have you considered reducing your meat consumption?



**Figure 12:** Respondents who would consider reduced meat consumption

Participants who consume meat were asked if they would consider reducing their meat consumption. 68.6% stated they would, whilst 31.4% said they would not. Most participants who would consider reducing their meat consumption were under 40 years old. The majority who would not consider reducing their meat consumption were men aged 30 to 39. 59.7% of women said they would consider lowering their meat consumption, compared to 45% of men.

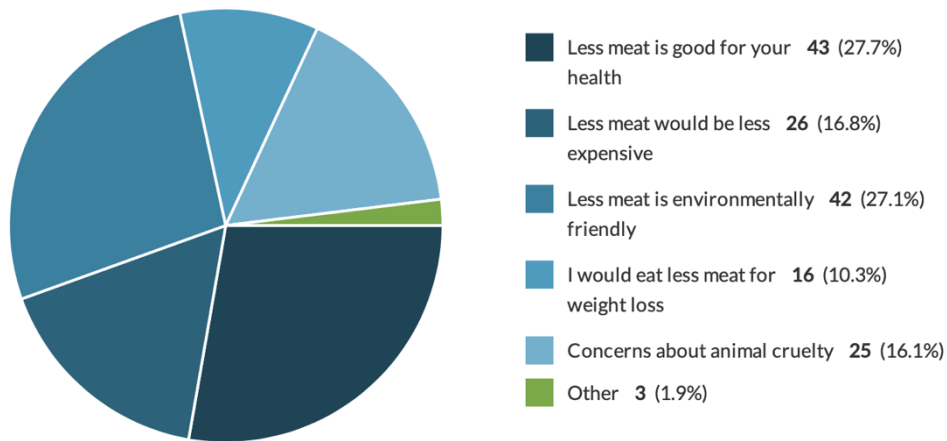


**Figure 13:** Reasons respondents would not give up meat

37.7% of respondents stated they would not give up meat, as they consider it to be part of a balanced diet. 26.4% similarly believe it is necessary for good health. 3.8% stated that avoiding meat would be difficult in their households, 17% stated that meat was a staple in their culture. 9.4% respondents did not see any reason to lower their meat consumption and 1.9% believe that their meat consumption did not have an impact on the environment. Of the respondents



who selected “other”, one of the reasons given for not reducing their meat consumption was that they simply liked the taste of meat. Another respondent stated that they had attempted a vegan diet, however they were not getting enough protein and became unwell.



**Figure 14:** Reasons respondents would consider a consuming less meat

The two prominent reasons selected for reducing meat consumption were less meat being good for health (27.7%) and less meat being good for the environment (27.1%). 16.8% stated that reduced meat consumption would reduce the amount of money they spent on groceries. 16.1% of respondents stated they would consider reducing their meat consumption out of concerns about animal cruelty. 10.3% believed lowering their meat consumption would result in weight loss. Amongst the respondents who selected ‘other’, reasons given for reducing meat consumption were that they did not like the specific meats, namely red meat.

#### 7.4.4 Food Sustainability Awareness

The food sustainability awareness section of this survey comprised of quantitative and qualitative questions. Questions pertaining to attitudes around food sustainability were intentionally placed towards the end of the survey. Questions that encourage participants to give their attitudes towards a subject can strongly influence how the rest of the questionnaire will be answered (Brace, 2013). Being aware of opinions given in previous questions, will often dictate how they answer forthcoming questions. In a bid to appear consistent, they may answer questions untruthfully. This same strategy applies to questions that request sensitive information, as the participant may view the survey as intrusive and may decline to complete the survey.

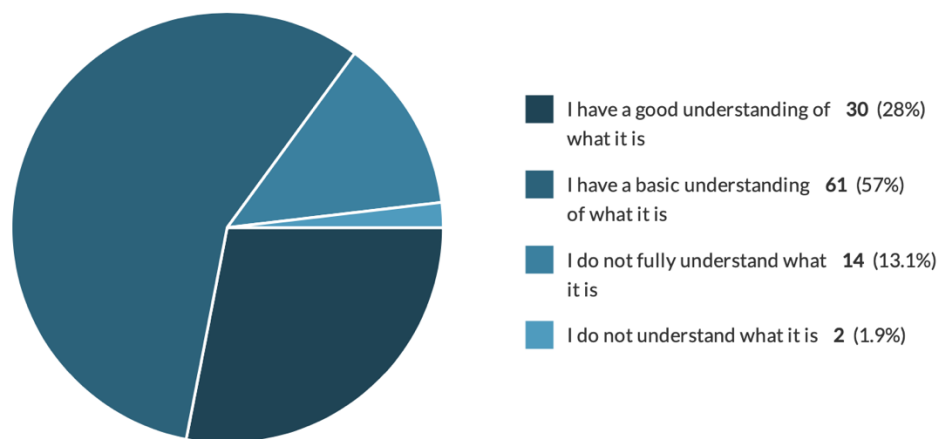
**Table 4:** Environmental impact on shopping

When shopping for food, do any of the following impact what you buy? (you may tick more than one)

When shopping for food, do any of the following impact what you buy? (you may tick more than one)	When shopping for or preparing food, do you consider how environmentally friendly the products are? (Please tick):				No answer	Totals
	No, this is not something I consider	No, I do not know what is considered environmentally friendly	Yes, some of the time	Yes, all the time		
Buying organic food	3.26%	0.47%	12.56%	1.86%	0.00%	18.14%
Buying locally produced food	3.26%	1.40%	22.79%	2.33%	0.00%	29.77%
Buying seasonal food	1.86%	1.86%	20.93%	2.79%	0.00%	27.44%
Buying fair trade products	2.33%	1.40%	13.49%	0.93%	0.00%	18.14%
None of the above	5.12%	0.47%	0.93%	0.00%	0.00%	6.51%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>15.81%</b>	<b>5.58%</b>	<b>70.70%</b>	<b>7.91%</b>	<b>0.00%</b>	<b>100.00%</b>

When asked if respondents consider how environmentally friendly products were when shopping, 63.6% said they sometimes did. 5.6% stated this was something they always consider, whilst 24.3% stated they did not. 6.5% of respondents said they did not know which products were considered environmentally friendly. 59.8% of respondents try to purchase locally produced products when shopping. 55.1% try to purchase season goods. 36.4% make efforts to purchase fair trade or organic goods. 13.1% of respondents did not consider elements such as seasonality or ethical production when shopping for goods. Amongst the respondents

who did consider how environmentally friendly products were, the sustainable factors they considered the most were seasonality and whether items were locally produced. Respondents aged 30 to 39 were most concerned with where items were produced, respondents aged 18 to 29 were equally concerned about seasonality and whether products were made locally. Respondents aged 40 to 49 were mostly concerned with whether products were fair trade. The highest ratio of participants who did not consider how environmentally friendly products are were aged 40 to 49.



**Figure 15:** Knowledge of food sustainability

57% of respondents stated that they had a basic understanding of sustainability, whilst 28% identified as having an above average understanding. 15% of respondents stated they did not fully understand or did not know what food sustainability was. The majority of those who said they had a good understanding fell into the 18 - 39 age groups. Most student participants fell into the categories of having a good or basic understanding of food sustainability.

**Table 5:** Food sustainability knowledge resources

Where does your knowledge and information on food sustainability come from? (you may tick more than one)	Which of the following statements best describes your knowledge on food sustainability:				No answer	Totals
	I have a good understanding of what it is	I have a basic understanding of what it is	I do not fully understand what it is	I do not understand what it is		
Reading books, articles	12.38%	14.29%	0.00%	0.00%	0.00%	26.67%
The news	6.67%	20.00%	0.00%	0.00%	0.00%	26.67%
Social media	3.81%	13.33%	0.00%	0.00%	0.00%	17.14%
Colleagues or classmates	3.81%	5.24%	0.00%	0.00%	0.00%	9.05%
Friends or family	2.86%	5.24%	0.00%	0.00%	0.00%	8.10%
Other	3.33%	1.43%	0.00%	0.00%	0.00%	4.76%
No answer	0.00%	0.00%	6.67%	0.95%	0.00%	7.62%
<b>Totals</b>	<b>32.86%</b>	<b>59.52%</b>	<b>6.67%</b>	<b>0.95%</b>	<b>0.00%</b>	<b>100.00%</b>

The main sources of information about sustainability selected by respondents were books or articles (61.5%) and the news (61.5). Aside from traditional media outlets, social media was the next most selected answer at 39.6%. Colleagues and classmates accounted for 20.9%, whilst family and friends accounted for 18.7%. For participants who had an above average understanding of food sustainability, the main source of information was books or articles. For those who had a basic understanding of food sustainability, the most selected response was the news. A good understanding of sustainability was highest amongst participants under 40 years old. A basic understanding was highest amongst individuals aged 30 to 39. The 1.9% who did not understand what food sustainability was were aged 18 to 29.

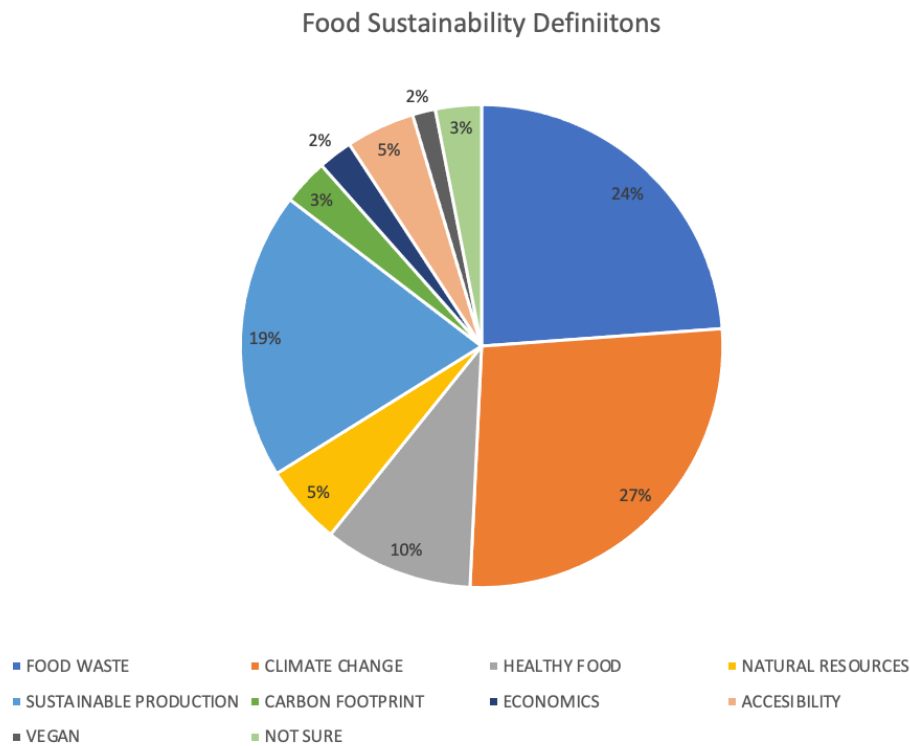
**Table 6:** Attitudes towards sustainability

Please select your age range (Please tick)	Please respond to the following statement: "I feel a responsibility to be more sustainable?"					No answer	Totals
	Strongly Agree	Somewhat agree	Neither agree/disagree	Somewhat disagree	Strongly disagree		
18 - 29	14.02%	13.08%	5.61%	0.93%	0.93%	0.00%	34.58%
30 - 39	18.69%	14.02%	9.35%	0.93%	0.00%	0.00%	42.99%
40 - 49	3.74%	3.74%	3.74%	0.93%	0.00%	0.00%	12.15%
50 - 59	1.87%	1.87%	2.80%	0.00%	0.00%	0.00%	6.54%
60 - 69	0.93%	1.87%	0.00%	0.00%	0.00%	0.00%	2.80%
70 and over	0.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.93%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>40.19%</b>	<b>34.58%</b>	<b>21.50%</b>	<b>2.80%</b>	<b>0.93%</b>	<b>0.00%</b>	<b>100.00%</b>

40.2% of respondents strongly agreed that they felt a responsibility to be more sustainable. 34% somewhat agreed, whilst 3.7% disagreed. 21.6% of respondent’s aged 18 to 29 disagreed with the statement, as did 23% of respondents aged 30 to 39. The general sentiment amongst participants who strongly agree, was that they felt a strong need to be sustainable and acknowledged the importance of individual responsibility. However, they also acknowledged that this was something everyone needs to do. 63% mentioned that environmental responsibility is a collaborative effort, many using the phrase “doing my part”. 35% of respondent’s mentioned the importance of preserving the planet for future generations, many specifying that they made efforts to be more sustainable for their children or to teach their children. 44.6% of responses included the phrase “small changes” and being sustainable where they could. 21% of responses included the importance of recycling. Amongst the responses that strongly agree, 33% of respondents mentioned food insecurity. Responses specifically stated that they were grateful to have food security or that they viewed food security as a leading issue.

Amongst the participants who somewhat agreed, there was a stronger sentiment that the responsibility was not for consumers alone, but for all areas of food production and consumption. Several answers pointing out the need for industry to reduce plastic packaging, as respondents felt it was difficult to avoid plastic. 72% of responses mentioned phrases such as “shared responsibility”. There was a greater concern about the financial cost of sustainable products, with 58% of responses mentioning balancing sustainability and affordability.

Amongst Participants who neither agree nor disagree, respondents felt the responsibility fell on government, food producers and supermarkets. Participants believe that supermarkets and restaurants need to also be held responsible for their food waste. Governments need to mandate sustainability and promote the consumption of locally produced goods.



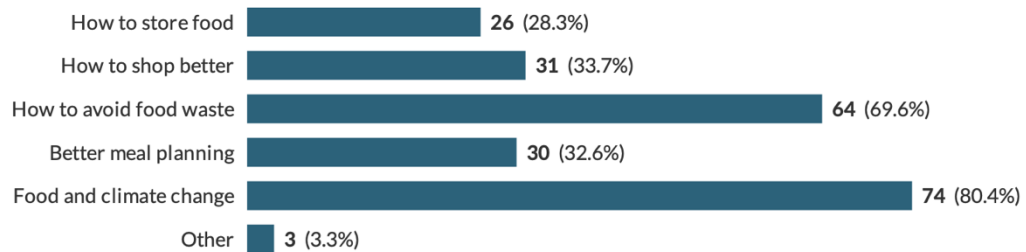
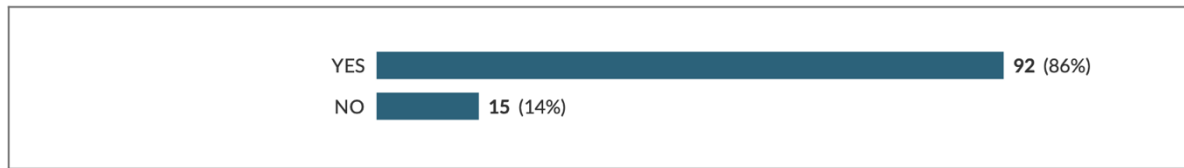
**Figure 16:** Consumer food sustainability definitions

The open questions were coded and grouped under frequently recurring phrases and words. Of the respondents who gave their definition of the term food sustainability, 28.9% of answers mentioned climate change, 25.6% mentioned food waste and 19.8 mentioned sustainable production. Many answers correlated food production with the climate crisis, expressing the need for a food production system that does not harm the planet or further contribute to the existing environmental issues. Some participants who mentioned food production in their answers also mentioned the need for more sustainable food packaging. In answers that included food sustainability and its impact on climate change, participants stated the food system would need to nurture people, land, communities and the environment. It would need to enhance the environment, as opposed to depleting it and improve quality of life for all habitants of the planet, now and in the future. Answers surrounding food waste centred around buying and preparing food in ways that are not wasteful.

Many respondents made the connection between healthy food not only meaning healthy for human consumption, but food that is ethically and sustainably produced, therefore 'healthy' for the planet too. Some respondents mentioned the importance of food being safe for consumption. Other issues that were touched on by respondents included affordability and quality. 5% mentioned accessibility. These answers covered human rights, food equality and having consistent channels of food availability. Several respondents mentioned having enough food to feed present and future generations. Only 2% of answers mentioned consuming less meat and dairy or becoming plant based as avenues that contribute towards food sustainability. 3% of respondents said they didn't know or were unsure what the term food sustainability means. One participant stated that "Food sustainability is about culture, education, health, equity and respect for the planet we live in." "It can cover a range of issues. Environmental as well as food waste and how the food is produced in a way that is efficient in terms of resources, processes, packaging and the workforce."

### 7.4.5 Food Sustainability and Education

Would you like to learn more about food sustainability for your home?



**Figure 17:** Food sustainability education

86% of individuals who took the survey, expressed a desire to learn more about food sustainability for their households. The majority of those who would like to learn more, had reported having a basic understanding of what food sustainability is.

Of the participants who would like to learn more about food sustainability, most were interested in learning more about food and climate change (80.4%), how to avoid food waste (69.6%) and how to shop better (33.7%). Suggested topics that were not on the list included education on how to grow your own food and accessible information on nutrition.



## **7.5 Discussion**

### **7.5.1 Food behaviour and household food waste**

Although much of food waste is industry related and a systemic issue that must be resolved by large corporations and government, household food waste is the one area where consumers have direct control over how much food waste occurs. The reasons behind food waste vary and are influenced by attitudes, social norms and behaviours related to food consumption (Stancu et al., 2016). It is important to understand where and why food waste occurs in households in order to minimise it and highlight areas where consumer education is needed. “Food waste strikes many consumers and stakeholders as an inequitable and unjust “luxury” that humanity cannot afford in light of our challenge to provide food for more people with less and more stressed resources. Reducing this waste is accordingly listed as one of the necessary actions for more sustainable food security” (Witzel et al., pp 6458, 2015). Understanding consumer behaviour in their households and kitchens exposes the areas where the general public are struggling to avoid food waste and highlights opportunities for change. It also allows for the identification of the main personal, social and environmental inhibitors of sustainable behaviour. This allows for the development of resources that can provide both short-term and long-term solutions towards improved sustainable practice in households.

#### **Food waste**

Household food waste can be divided into three categories: food scraps, leftovers and suboptimal food. Witzel et al. define “suboptimal foods” as food that is undesired for consumption as it is visually unappealing or has expired (Witzel et al., 2015). Visually suboptimal foods are foods that are not visually perfect but are safe for human consumption. Suboptimal expired foods are foods that were fit for consumption when purchased but became inedible within the household. This survey specifically investigated suboptimal expired foods, further research could explore visually unappealing foods and how much they contribute to overall food waste. It is worth noting that the majority of these results were obtained during a period of COVID-19 lockdown (March to April 2021) and whilst the cities were reopening (late May to early June 2021). COVID-19 impacted eating habits and purchasing behaviour. The lockdowns and reopening’s affected access to groceries, restaurants and bars. During periods of reopening (July/August 2021), there was an increase in consumers eating out, as the

“Eat Out to Help Out” Scheme was ongoing (WRAP, 2021). These periods of restriction most likely impacted the findings of this survey, as participants were spending more time at home.

This survey revealed that 53.3% of households throw away food at least once a week, of this percentage, 28.04% are larger households of 4 people. This finding correlated with other recent studies that show large households tend to produce more food waste (WRAP, 2019) (WRAP, 2021). The food items that are thrown away the most frequently are fresh vegetables (26.1%), fresh fruits (19.5) and bread (15.5%). Unopened or partially eaten fruits and vegetables accounted for the highest percentage of food waste, this was closely followed by food waste from meals and inedible parts such as peels and stems. Fresh fruits and vegetable were also the most frequently purchased. This indicates that consumers are either purchasing them too frequently or in too large quantities. This correlates with research on food scripts that indicates that, these ingredients are potentially being purchased out of habit and consumers are not checking whether they are low in stock within their homes. It could also point to not storing these ingredients properly, leading to them spoiling quickly, before they can be consumed (Di Talia, 2018).

Cooked grains and pasta were almost exclusively thrown away as leftovers. All respondents who threw rice away indicated that the rice was left over from meals. It is unclear whether this rice was thrown away directly after the meal and what percentage was leftovers that were refrigerated then thrown away. Rice is an ingredient that stores well, can be frozen and is versatile for use in leftover meals, thus its relatively high disposal rate requires more data. Bread was thrown away as leftovers or partially used. Bread is another ingredient where freezing is a great method of preservation, as the flavour and texture are typically unchanged. 60.8% of the bread food waste was thrown away as leftovers from meals, 56.9% was thrown away opened and partially used. This could have been avoided had the bread been refrigerated or frozen. Unless mouldy and inedible, bread is a food that works well in numerous leftover dishes and desserts.

Foods that were thrown away the least were snacks (chocolates and crisps), cheese and eggs. Unsurprisingly, shelf stable items were the least reported as food waste. Snacks, legumes and pasta had low food waste responses. Legumes and pasta were predominantly thrown away as leftovers. Prior to cooking, these items like rice are shelf stable. These results imply respondents were cooking portions that were too large, leading to leftovers. Other items that

contribute towards food waste but were not explored in this study are speciality products. These are ingredients consumers purchase specifically for a dish or occasion. Research indicates that speciality products, often go unused, eventually expire and end up being thrown away (Witzel et al., 2015).

Analysing demographics such as age in relation to food waste were a challenge with these findings as the majority of individuals who participated in this study were between the 30 and 39, hence the research pool was not big enough. A 2018 food waste study conducted in Italy revealed noteworthy correlations between age, income and attitudes towards food waste. It was found that, although attitudes towards avoiding food waste were similar across ages, food waste practices within homes differed. Older participants with a higher income were found to be more likely to discard fruits or vegetables that were slightly damaged, even though they were still most likely edible. These individuals were also more likely to throw away food that expired on that day, than risk consuming it (Meo et al., 2018). Meo et al. theorise that younger individuals or individuals earning less are more vigilant about food waste, as they are more aware of the financial and environmental impacts of food waste (Di Talia, 2018).

Many of the studies reviewed during this project found a significant difference in the levels of food waste dependent on the participant age groups (Witzel et al., 2015) (Meo et al., 2018), however the age range within the participants of this study was not large enough to confirm or contest this. As the food behaviour was self-reported, it can be expected that participants under-reported their household food waste. “A potential cause could be that an average week is difficult for consumers to imagine. Food waste is unplanned for and can easily be trivialized as being due to exceptional circumstances and therefore not part of what would constitute an average week.” (Herpen et al., pp 2768, 2019). Individuals are not acutely aware of how much food they actually wasted, especially if being asked to recall their waste over an extended period of time.

## Food waste reasons

The main reasons selected for throwing away food were products being past their 'use by' date (33.5%), cooking too large a portion (16%) and buying groceries in excess (14%). WRAP's 2019 food waste survey confirms this, as their survey revealed that the most common reasons for food waste to be cooking portions that were too large, food spoiling before they could be used and unappetising taste (WRAP, 2019). Various reasons could contribute to this, the results suggest that purchasing too much is a contributing factor. The promotion of bulk purchasing by retailers, such as "Buy one get one free" (BOGOF) also contribute to food waste by promoting excessive purchasing (Schanes et al., 2018). Individuals who buy too much fresh produce may find that they are not able to cook them all in time, products may be expiring within the home as a result of their fridges being overfilled. Unoptimized food storage results in food being unseen and unused before it expires. The result of 75% of fresh fruits being discarded partially open makes a strong case for selling fresh produce loose. Pre-portioned bags contribute to consumers purchasing more than they need. Selling more fresh produce loose will reduce the amount of both plastic and food waste (WRAP, 2018).

When asked to elaborate, participants expressed that they only threw away food that was spoilt and considered inedible. Others expressed that the quantity of some pre-packed vegetables is too large, and they cannot finish them before they start to go mouldy. Aside from spoilt food being unappetising, the fear of consuming spoilt food and falling ill may also be contributing to the high quantities of fresh food waste. Although this aspect was not explored in this research, existing research shows this to be a main concern consumers consider when deciding when to throw away a food product. "Consumers thus weigh priorities on waste avoidance for the sake of the environment versus safety for oneself and immediate others." (Witzel et al., pp 6464, 2015). Amongst the many factors consumers are juggling whilst shopping (trying to stay within a budget, time constraints, dietary limitations, household preferences etc..) food safety is a major concern and trumps food waste as a priority. However, not all food that has reached its use by date is unfit for consumption. The perceived risk of how unsafe a food is, is heightened when consumers are not educated on factual food safety (BEUC, 2020)

11.2% of respondents selected eating out frequently as a cause of household food waste. This was low in comparison to national results of 56% (WRAP, 2021). Studies show that eating out frequently does contribute to food waste and apathy towards food being thrown away (Schanes

et al., 2018). Several respondents stated that although produce was still in date, once open, the vegetables tend to go off very quickly. A small proportion expressed having to throw away partially opened or leftover food in order to decongest their fridge. Issues related to fridge congestion and dealing with leftovers are all related to shopping habits. Extending food longevity can be addressed by advising on best practice when it comes to food storage in households.

Less than 2% of respondents stated they found the date labelling confusing. However, research indicates that they do confuse consumers and contribute towards food waste (WRAP, 2020) (Martindale, 2014). Misinterpreting food labels can lead to produce that is safe to eat being thrown away unnecessarily, or adversely produce that has expired being kept in the home. Consumers tend to be heavily reliant on labels, discarding produce that is edible based on “best before” dates (WRAP, 2020), instead of using sensory assessments like smelling or tasting the food (Schanes et al., 2018). Although only a small proportion selected this response, clear food labelling cannot be overstated. An estimated 20% of food household food waste could be reduced if consumers were better educated on storage and expiry date labels (Martindale, 2014). Further education on labelling, best before vs use by and utilising sensory cues could contribute to reduced food waste (FSA, 2021). Consumer organisations can contribute by reviewing sustainable product labelling to minimise the risk of misinformation and build consumer confidence (BEUC, 2020).

Participants were given the option to select “other” and provide an answer that was not on the list, food spoiling before it’s use by date was frequently reported in this section. Leftovers and spoilage were two answers that were overlooked when developing this question, as these responses account for 10.5% of responses for food waste reasoning, it would have been valuable to include them as options. More data is needed on leftovers as food waste, whether they are the unplanned result of cooking large portions/picky eaters/leftovers from restaurants or whether they are prepared intentionally and not consumed. Using leftovers is stated to be a valuable step in combatting household food waste (Schanes et al., 2018). 10% of responses selected the product being past its “best before” date as reasoning for food waste. It would be beneficial to distinguish whether these items were stale, inedible or whether consumers confused the best before date with the use by/consume by dates. Only 6.5% of respondents stated they did not plan their meals. However, the large percentage of products expiring in the home and respondents who stated they purchase too much or frequently make unplanned

purchases signifies a lack of meal planning. “Lack of time” would have been a useful addition to the food waste reasons question, as some individuals may find that their schedules do not allow time for cooking. WRAP credit the pandemic with the reduction in household food waste during the year 2020, as consumers were utilising more food management skills in their homes. Since the return to work and school, food waste levels have returned to normal, and lack of time is a major reason (WRAP, 2021).

### **Food shopping & storage**

As this survey took place during March 2021 of the COVID-19 pandemic, shopping behaviour for most households was impacted. Consumers were shopping less, however when they were buying more (WRAP, 2020). The pandemic heightened concerns about food availability and in order to avoid shortages, consumers purchased certain products in bulk. Although consumers were purchasing more than usual, they reported that their food waste was down by 43% (WRAP, 2021).

Most households shop for groceries at least once a week (67.3%). The correlation between the frequency of shopping and the rate at which households throw away food is evident. The regularity with which fresh produce is thrown away unopened indicates that it is expiring or spoiling before consumers can cook it. Fruits and vegetables were the products most recorded to be discarded unopened and uneaten. Aside from products expiring, shopping in excess appears to be the largest contributing factor. A finding that is reiterated in several studies is the importance of preparation and its relationship to food waste. Skills such as preparing shopping lists and managing food within the household directly impacted food waste (Stancu et al., 2016). A 2018 study highlighted the connection between unplanned shopping and food waste. Individuals who shopped impulsively based on their preferences whilst at the supermarket, tended to throw away more food at home (Meo et al., 2018). The results of this survey reveal similar results. Participants were asked if they prepare a shopping list before doing their shopping and whether they impulsively purchased items that were not on the list. Although the majority participants reported they prepared lists and checked grocery stocks before shopping, 48% admitted to occasionally making unplanned purchases, whilst 17% stated they always did. WRAP’s 2020 food waste survey found participants scored relatively high (7.3/10) for checking which ingredients were missing but were less successful (6.7/10) at making a detailed shopping list (WRAP, 2020). The number of participants who regularly make unplanned

purchases of sale items reported products expiring in the home and purchasing too much as the main reasons they threw away food. This indicates that making unplanned purchases leads to food waste. It can lead to excessive amounts of food being in the home and the household not being able to consume everything before it expires. Another study suggests that fixed shopping routines, as opposed to shopping when specific items are running low, could lead to over-shopping, which in turn can lead to food waste (Stancu et al., 2016). Planning ahead of shopping trips by making detailed lists and trying to only purchase what is needed is useful (Schanes et al., 2018).

Packaging plays a role in the choices consumers make when purchasing food. What the packaging is made out of, whether the material is recyclable and what information is readily visible on the packaging all impact food waste (Witzel et al., 2015). “In general, consumers do not make optimal use of packaging functions or the information provided on it, and they are not aware of how packaging might prolong the product’s lifetime at home” (Witzel et al., pp 6463, 2015).

Two sustainable food practice that were not included in the survey were food preservation and home freezing. It would be beneficial to gain data on whether or not households use food preservation techniques to extend the longevity of food products (Martindale, 2014). Food preservation is not only sustainable, but it can also be very cost effective. Food preservation techniques such as pickling or fermenting foods not only extend their shelf life, but they can also improve their nutritional benefits. Home freezing is now an everyday practice, but it is an effective preservation method. In most households it is used to prolong the shelf life of foods, it can also be used more strategically to freeze specific foods when they are in season, in order for them to be enjoyed when they are out of season (Martindale, 2014). During the height of the pandemic, WRAP recorded an increase in households freezing precooked meals and leftovers. The majority of households stated they purchase frozen foods for their convenience. In their most recent survey, this behaviour has declined back to pre-COVID levels (WRAP, 2021). Freezing can also be used for meal planning or to preserve leftovers. Foods that have not yet been consumed but are nearing expiry could be frozen and consumed at a later date, instead of being left to spoil. Unfortunately, the texture and integrity of many of the foods that spoil the fastest (namely fruits and vegetables) does not survive the freezing process. Unless the foods are going to be cooked or pureed, defrosting them leaves them in an unappetising state.

## **Meat consumption**

Making changes to diets and reducing meat consumption can be a positive change for consumer health and the environment. Excessive meat consumption and the production of meat-related products are often publicised as one of the leading contributors to environmental degradation (Sanchez-Sabate et al., 2019). Many studies surrounding food sustainability advocate for reduced meat consumption. These studies highlight that, within food production, meat-related products have the largest negative impact on the environment, in comparison to their plant-based counterparts (Rejman et al., 2019). The World Health Organisation advocates for a diet with lower meat consumption, in order to address obesity (Nicholls, 2020).

75.7% of respondents eat an omnivore diet, 12.1% are vegetarians and 6.5% are vegan. The majority of participants who identified as vegan or vegetarian were under the age of 30. This indicates that there is a higher uptake of alternative diets amongst the youth. Of the vegan respondents, none of them were male. Within the genders, 13.8% of men consumed a meat-free diet, whilst 19.48% of women did. These results imply that women are adopting meat-free diets at a slightly higher rate than men. These results coincide with the current food trends and the growing shift towards consuming fewer animal-based products, current research advises that gender should be taken into account in order to create targeted messaging (BEUC, 2020). A large percentage of the participants who consumed a vegetarian diet were of Indian or Pakistani descent, this correlates with vegetarianism being a part of their cultures.

When asked whether they would consider consuming less meat 68.6% of participants said they would. This percentage was relatively high, as similar studies examines consumer attitudes surrounding meat consumption reveal that the percentage of consumers who are aware of meat consumptions environmental impact and are willing to make changes to their diet for environmental reasons is low (Sanchez-Sabate et al., 2019) (BEUC, 2020). Of the 31.4% that would not consider reducing their meat consumption, the main reasons were meat being considered a part of a balanced diet (37.7%), meat being important for good health (26.4%) and meat being a staple within their culture. Although many individuals may be resistant to omitting meat from their diets, studies show that they are not opposed to increasing the intake of vegetables and vegetarian products (BEUC, 2020). 9.4% of respondents saw no reason to stop eating meat. When prompted for further explanation, respondents stated they enjoyed the taste of meat too much to quit and when having tried a plant-based diet, they felt unwell. Of the respondents who would reduce their meat consumption, they considered consuming less



meat to be good for their health (27.7%) and eating less meat would be good for the environment (27.1%). Concerns about animal cruelty and the financial cost of meat were also notable reasons to reduce meat consumption. Of the meats that participants would consider reducing their consumption of, red meat was cited the most. Of the participants who said they would not consider reducing their meat consumption, 65% opted not to provide any reasons. This outcome implies a resistance to discuss lowered meat consumption and potentially resistance to considering it as an option. Conversations around vegan or vegetarian diets are often met with resistance from omnivores, as these lifestyles are often viewed as disapproving of meat consumption (Dhont and Stoeber, 2020). As a result, veganism tends to illicit defensive reactions from meat-eaters. There was a higher percentage of resistance to reduced meat consumption amongst men at 41% compared to 19.4% of women. When trying to engage with consumers who don't acknowledge the environmental impact of their meat consumption, it is advisable to approach the subject of reduce meat consumption from a position of its health benefits (BEUC, 2020). The survey results indicate that individuals under the age of 40 are more likely to consider reducing their meat consumption. The results also imply that women are more likely to consider reducing their meat consumption than men.

## 7.5.2 Food Sustainability Awareness

One of the aims of this study was to gain a deeper understanding of the public’s current awareness and attitudes towards sustainability. This survey also aimed to explore whether there was a public desire to learn more about food sustainability, and if so, what subjects in particular participants had an interested in. When asked how knowledgeable participants thought they were about sustainability, 59.2% of participants stated they had a basic understanding of food sustainability. This demographic cited the news as their primary source of information regarding sustainability. Amongst the 32.86% who had an above average understanding of sustainability, reading books and articles was their main source of information. The survey revealed that age groups 30 to 29 and 18 to 29 were most aware of sustainability and concerned with being involved in sustainable change. This news being a main source of information on sustainability was expected, as sustainability and the environmental crisis are currently being highly publicised and events such as COP26 have ensured substantial news coverage. 39% of responses indicate communication with colleagues, classmates, friends and family were sources of information about sustainability. These results imply that within this survey pool, participants are having conversations about sustainability.

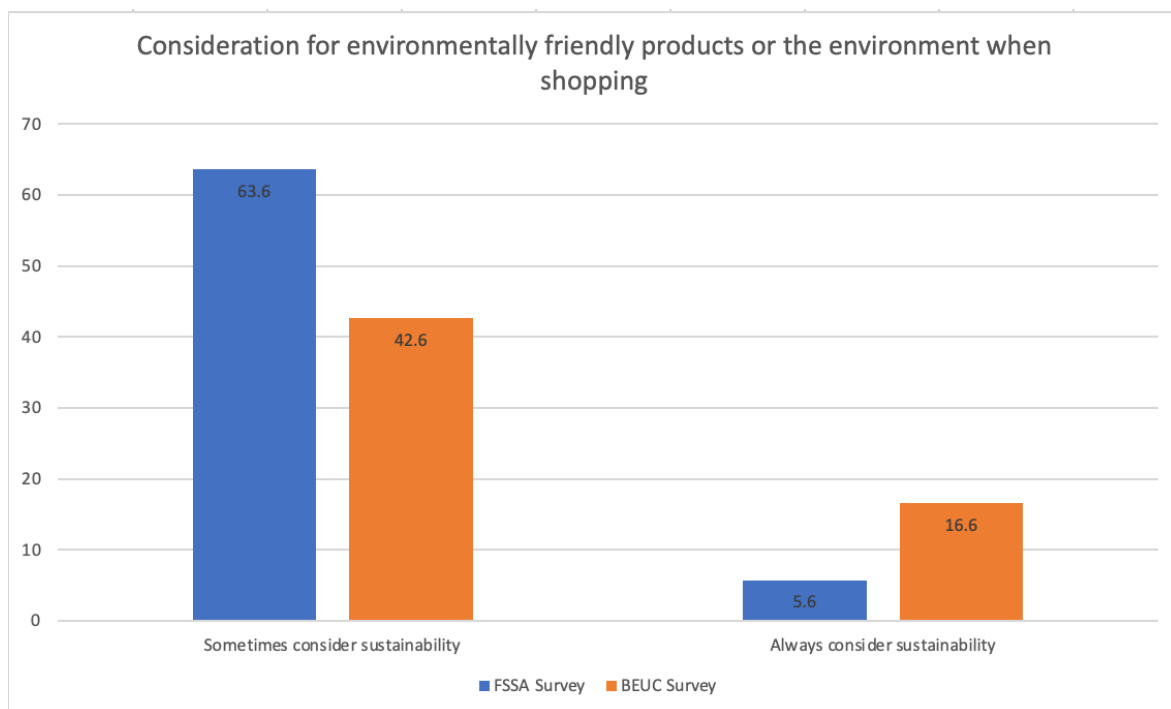
**Table 7:** Food sustainability knowledge & employment

What is your current employment status? (Please tick)

What is your current employment status? (Please tick)	Where does your knowledge and information on food sustainability come from? (you may tick more than one)						No answer	Totals
	Reading books, articles	The news	Social media	Colleagues or classmates	Friends or family	Other		
<b>Full-time employed</b>	10.95%	14.76%	7.62%	2.86%	3.33%	1.90%	2.86%	44.29%
<b>Part-time employed</b>	4.29%	4.29%	2.38%	2.38%	1.90%	0.00%	1.43%	16.67%
<b>Self-employed</b>	0.95%	0.95%	0.48%	0.00%	0.48%	0.00%	0.00%	2.86%
<b>Unemployed</b>	0.95%	0.48%	0.00%	0.00%	0.48%	0.00%	0.00%	1.90%
<b>Part-time student</b>	3.33%	0.95%	2.86%	0.48%	0.00%	0.48%	0.48%	8.57%
<b>Full-time student</b>	6.19%	5.24%	3.81%	3.33%	1.90%	2.38%	2.86%	25.71%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>26.67%</b>	<b>26.67%</b>	<b>17.14%</b>	<b>9.05%</b>	<b>8.10%</b>	<b>4.76%</b>	<b>7.62%</b>	<b>100.00%</b>

The majority of respondents to the survey were in fulltime employment, the next largest segment were fulltime students. Of the respondents in fulltime employment, the main sources

of information about sustainability were the news and social media, the student population produced a similar result. Based on these results, the media appears to be a prominent stakeholder with regards to disseminating information about sustainability and the environmental crisis, as the general public utilise them as a source of reliable and accurate information. It can be argued that, without the media, many environmental strikes and organisations involved in the sustainability movement would not be as well-known if it wasn't for their media publicity. Governments and sustainability initiatives could use this as an opportunity to collaborate with media outlets in efforts to distribute practical information about sustainable practice. The largest demographic of respondents were women aged between 30 and 39 years old. Roughly 64% of participants were employed in some capacity, 33% were students. The demographics research indicates that the majority of respondents are highly educated and currently employed or in education. Several studies found that individuals who identified as green consumers were primarily younger and fell into a higher income bracket (Melović et al., 2020). Of all the age groups, participants under the age of 29 were the most concerned about climate action (Schlange & Co, 2020).



**Figure 18:** Consideration for environmentally friendly products when shopping

Participants were asked whether they consider how environmentally friendly items they are purchasing are or whether they consider elements such as seasonality and ethical production when shopping. 63% of respondents stated they sometimes considered how environmentally friendly their products were when making purchases. Schlange & Co's global sustainability study asked a similar question, where respondents were asked how much they considered sustainability when making decisions about goods and services or food and nutrition. 52% of global respondents said considered sustainability when making choices about food and nutrition, whilst 56% globally considered sustainability when selecting goods and services (Schlange & Co, 2020).

When making sustainable choices, consumers are not only considering their immediate needs, they are also considering the needs of their community and the environment (White et al., 2019). Recent research show that although many consumers express concerns about the environment and a desire to make more sustainable choices, these desires don't always translate into sustainable action. Even though consumers express concern about the environment, this concern is not as apparent in their shopping behaviour and food choices (Rejman et al., 2019). Over 50% of participants in this study considered sustainability most frequently whilst shopping, making choices related to food and health (Schlange & Co, 2020). Schlange & Co underline how consumer interest in sustainability whilst shopping presents a economic opportunity (Schlange & Co, 2020). The development of more sustainable products and services provides consumers with a wider variety of environmentally friendly options. Although consumers may be aware of products that are environmentally friendly or fair trade, they only purchase them on occasion (Melović et al., 2020). "Their willingness to pay premium prices for green products are influenced by social altruism and the level of their concerns on environmental pollution, as well as by the level of their personal responsibility" (Melović et al., pp 4, 2020).

When asked whether they felt a responsibility to be more sustainable 40% of participants said they strongly agreed, only 5.6% stated sustainable products were something they considered all the time whilst shopping. Of the 3.7% who respondents disagreed, they expressed that whilst sustainability is something everyone should be concerned about, the responsibility lies with government and large production industries. The European Consumer Organisation (BEUC) survey found its participants had similar sentiments, they felt that government action was necessary to build awareness about food sustainability (BEUC, 2020). Of the 21.5% who did

not feel strongly either way, there was the same appeal for production industries and governments to take action, however they acknowledged they also had a part to play. The global sustainability survey obtained similar results, as respondents felt government was most responsible when it came to executing sustainable change Schlange & Co, 2020).

## **Interest in sustainability education**

Addressing food sustainability within households addresses more than just food waste. Sustainable food practices benefit several aspects of human life aside from environmental, such as health, economy and society. 86% of the survey participants stated they would be interested in learning more about sustainability. Of those who stated they would not, the majority were men aged 30 and above. Education on food and climate change was selected by 80.4% of respondents, this correlates with the number of respondents who had basic understanding of food sustainability.

Meal planning was one of the least selected subjects to learn more about. Meal planning reduces food waste, as many of the decisions and routines that contribute towards food waste are mitigated (Schanes et al., 2018). WRAP's 2021 Food Trends survey revealed that the majority of households scored low for meal planning (WRAP, 2021). Planning meals allows households to keep a close eye on what food they have in their households and what foods they need (Stancu, 2016). Meals are planned in advance, ingredient lists and amounts are available when shopping, in order to avoid purchasing too much. This also reduces the risk of leftovers that go un-eaten and eventually thrown out. Meal planning reduces the ambiguity of not knowing what to cook and relying on eating out or takeaways as a result. The fact that participants did not see it as a subject they could benefit from, highlights the lack of awareness around it and its benefits. "Food-related routines are much influenced by the skills or confidence that consumers have in their ability to perform these activities." (Stancu et al., pp 9, 2016). Research shows that lacking skills such as cooking, limits the food options people have (WRAP, 2021) (Melović et al., 2020). Being unable to cook means individuals are not willing to exert extra time or effort on their meals, they are not willing to explore different foods, as they are not confident in their cooking abilities (Stancu et al., 2016). Therefore, a lack of cooking skills can lead to a limited diet and a reliance on pre-packaged meal. The most direct way to impact behaviour surround food behaviours and food waste is to increase awareness on the issue, provide information and most importantly provide outlets where people can improve their skills and knowledge to manage food better in their homes. Practices such as meal planning, writing lists and shopping better indirectly reduce food waste, whilst cooking skills, food storage and reusing leftovers directly impact it (Stancu et al., 2016) (Schanes et al., 2018). Both indirect and direct methods are important and in combination they can vastly improve the levels of food waste within households.

## **Limitations**

This survey did not garner as many responses as were initially expected. The small pool of participants limited the scope of answers obtained, but still provided sufficient data sample to prompt further research. Future work could delve into the many ethical and religious reasons that may deter food waste; these could be explored further in a more nuanced study with a larger research pool. Future work could also include the SDG's, as the survey did not gather information on how aware consumers are of the SDG's and whether they play a part in their lives.

The food waste segment of this survey was dependent on self-reporting, which is imprecise as it is reliant on the participants memory. Future work could utilise food diaries. More information on the state of leftovers would have been beneficial. Although the survey revealed which foods were thrown away most as leftovers, it did not expose whether those leftovers had been refrigerated prior to being thrown out, or they were directly from dinner plates. Reasoning behind not consuming leftovers can also provide important insights into food waste, as it provides data on how households assess and ultimately throw out leftovers (Schanes et al., 2018). Another valuable piece of information would have been how households utilise freezing and how frequently they freeze foods within the home. The large amounts of items such as bread and rice that were thrown away indicate that these items were not often frozen in respondent's home. All these items are good candidates for freezing and this would have reduced the amount of food waste they contributed to. Obtaining data on freezing would have also given an indication as to how meat and fish are stored in households. The majority of waste created from meat and fish was in the form of inedible scraps (bones, skin etc..). Further information on home freezing, getting an indication of how often households do it and with which products would provide insightful data.

## 7.6 Summary

Further research - The main reasons given for not reducing meat consumption were meat being part of a balanced diet and meat being important for good health. Whilst an omnivore diet is healthy, reduced meat consumption is beneficial for improved health. Vegan and vegetarian diets were least selected amongst individuals who identify ethnically as black, they accounted for 7% of the overall vegetarian respondents. It would be of interest to explore the uptake of vegetarian diets or reduced meat consumption within minority communities. An area this study did not touch on but would be beneficial to get insight into is, how the visual appearance of foods play a part in food waste. Another avenue that could be explored in more detail would be questions surrounding leftovers, what households do with their leftovers, how long they typically keep leftovers for and whether they consume the leftovers. It would be beneficial to gain further insight into how family dynamics and culture contribute towards food waste. Exploring the “good provider” identity and how having an abundance of food in the home can be seen as a sign of wealth is of great interest. Current research shows that factors such as having young children or a high-pressure lifestyle contribute to the levels of food waste a household produces (WRAP, 2021) (Schanes et al., 2018). It would be informative to gain insight into where families or multiple occupancy households have to compromise when it comes to sustainable behaviour. Although an individual may have a great awareness of sustainability and want to incorporate more sustainable practices into their lives, they may be restricted by their living situation, culture or religion. As food plays a large role in many cultures, certain sustainable practices may work against that, causing tensions.

Although household food waste contributes significantly to food waste, it is imperative that steps are taken at all levels of the food supply chain in order for there to be significant change. Steps need to be taken to minimise food loss upstream within food production, as it is currently a linear unsustainable system (Witzel et al., 2015). Although there was a decline in household food waste during the height of the pandemic, it has now returned to pre-pandemic levels (WRAP, 2021). Given the many factors influencing consumers daily lives, household food waste will never be eradicated. It can however be minimised, using a variety of practical steps at all levels of the household food chain such as meal planning, preparing shopping lists, proper food storage and better understanding of food labelling. The correlation between planning and reduced food waste is an area that needs more attention and solutions to help close the gap (Meo et al., 2018). Knowledge on these skills can be distributed through leaflets or other



frequently used information channels such as social media. These skills can also be taught through classes that can be made available via community run initiatives or online workshops.

Many food waste scenarios occur as a result of a lack of knowledge. Many consumers lack knowledge on household food management, correct storage and cooking (Witzel et al., 2015). For there to be a radical change in the way people live their lives education is crucial (García-González et al., 2020). The findings of this study can be used to inform the development of a food waste resources targeted at households.

## **CHAPTER 8: CONCLUSION & RECOMMENDATIONS**

### **8.1 Overview**

This research found that consumers believe themselves to have a basic understanding of food sustainability and given the opportunity, most people would like to learn more. The survey revealed a demand for education on minimising household food waste, food and climate change. The more consumers know about food sustainability, the better informed they are to make sustainable choices. A better understanding of the interconnected systems of food production, food waste and climate change can be provided through online resources, social media and workshops that can be hosted digitally or in person. For in-person learning experiences, urban farms provide an ideal space to reconnect with food, nature and one's local community. Collaborating food sustainability education with local community gardens and urban farms is beneficial for, the participants, the farms and the community.

### **8.2 General conclusion**

Based on the survey conducted during this research and existing works, sustainability awareness is growing. This is namely due to the high coverage of the current environmental crisis and global sustainability events, such as COP 26. Consumers are concerned about the climate crisis and show a desire to be more sustainable, however behavioural and financial barriers are significant inhibitors. Whilst the public have a raised awareness of the environmental crisis and growing concern for sustainability, this does not equate to sustainable action. Green consumerism is gaining momentum, however drawbacks such as greenwashing and continued overconsumption work against it. Factors inhibiting sustainable practice tend to fall under behavioural, financial or social factors. The attitude-behaviour gap, lack of planning and excessive shopping contribute greatly to household food waste. Lack of understanding of food labels, correct food storage and food management in the home sees food that was at one point fit for consumption spoiling and being thrown away. For there to be long-term behavioural and rational shifts amongst consumers both education and mandated nudges need to be implemented.

Education within the context of food sustainability involves consumers understanding sustainable practice, knowing how to implement it and having access to resources that will improve the climate literacy. This will result in consumers who are conscious of their impact on the planet and able to identify sustainable solutions and alternatives (Payne, 2015). Educating on sustainability is fundamentally interdisciplinary. It encompasses social science, philosophy, economics, politics and ecology. EfS can provide the necessary interdisciplinary approaches to sustainability that are instrumental in creating long-term behavioural change. Utilising EfS approaches to develop transformative learning resources for online and in-person can be an effective strategy for educating the public on food sustainability.

### **8.3 Key Findings**

- Consumer awareness of sustainability and climate crisis is relatively high, given that these are highly publicised issues at present. Although consumers are aware of sustainability and its importance in relation to climate change, there is less awareness of what sustainable practice entails and what actionable steps they can take to be more sustainable. Factors such as greenwashing confuse consumers and the high prices of sustainable alternatives deter them from choosing sustainable options.
- The majority of survey participants stated they had a basic understanding of food sustainability, their main sources of information being the news, books, articles and social media. When asked to explain what food sustainability meant to them, participants most frequently spoke about climate change and the importance of reduced food waste.
- 86% of survey participants expressed an interest in learning more about sustainability. The most selected subjects were learning more about the food system and climate change, better shopping and how to avoid food waste.
- The main factors that inhibit sustainable practice in individuals can be divided into three main groups: behavioural, financial and social. For individuals who do have a desire to live more sustainably, financial barriers are the main factor that inhibit the purchase of more sustainable options. The attitude behaviour gap is the space between consumer intention and sustainable action, it is within this gap that the factors that inhibit sustainable practice are experienced.

- Current research advocates for a holistic approach to public sustainability awareness. Using a combination of behavioural nudges and education in order for sustainable practice to be adopted by more people. Behavioural nudges alone, are not sufficient, as they do not result in individual action to make further sustainable changes.
- Educating on food sustainability has many benefits for individuals and their communities. Individuals gain practical skills that can improve the way they store, cook and shop for food. Once implemented in households, these skills can lead to more sustainable living. A better understanding of food sustainability reconnects individuals with food production. An improved awareness of food sustainability results in better household food management and reduced household food waste.
- Current research states that education is key in the goal for more sustainable consumers. This education requires a combination of easy and long-term habitual changes, deepened understanding of the importance of sustainability and a shift in sustainability worldview. Individuals need to reconnect with the food system and the production of food, an avenue that addresses all these aspects is urban farming or participating in community garden programs. Education on food sustainability can also be delivered online. Workshops can feature in-person and digital options to accommodate consumers.
- Only 1% of green spaces within the UK are currently used for urban growing. This highlights an avenue of opportunity for local councils, government and food initiatives to collaborate on projects that promote urban growing and utilise existing green spaces for food growing and food sustainability education.
- Educating on food sustainability ideally should result in transformative learning, where individuals change their habits around and their attitudes towards food. Transformative learning can be achieved by utilising EfS learning approaches that incorporate experiential learning, collaborative learning and self-reflection as key elements.
- Households' food routines, or "food scripts" directly and indirectly impact the amount of food waste a household produces. This includes actions such as the frequency of food

shopping, cooking, food storage. The survey revealed that the main causes of household food waste are products being passed their “use-by” date, purchasing in excess and cooking too large portions. Fresh produce is the most frequently thrown away.

This project focused on the individual and their relationship to sustainability. The focus was assessing inhibiting factors to sustainable behaviour and possible avenues to overcome these through informal education. Although it is important for individuals to acknowledge their accountability when it comes to their sustainable practices, the next step is for those individuals to come together and push for change within the larger food system. Consumers sustainability is important, but governments and food producers must take the lead by reducing food loss within the supply chain, reducing the use of single use plastics and implementing sustainability into policy. The food system cannot change if those who operate within it do not understand the impact it has on the environment. Once individuals understand the importance of sustainable practice in everyday life, it is important for them to request accountability from the big players in food industry, as this is where significant shifts in food production and distribution need to happen. When there is accountability from all parties, we can begin to see real change.

## 8.4 Recommendations

The survey revealed numerous avenues for further research, namely deeper analysis of the behavioural elements that lead to food waste, the reasons and circumstances that lead to leftovers and the uptake or resistance to lowered meat consumption in specific groups. The next steps would be for this research to explore the finer points that affect communities and their efforts to become more sustainable. Due to time constraints, intersectional avenues were not explored in-depth within this research. Exploring the intersectional aspects that affect different communities such as race, genders and age will allow for more nuanced workshops to be developed and possibly result in a higher uptake of sustainable practices. As expressed in this research, Education for Sustainability philosophy affirms that the social, economic and environmental aspects of our lives intersect and should be approached holistically. The Decarbonise & Decolonise (D&D) movement addresses the intersection of the climate crisis, degrowth and climate justice. As this research was conducted with a metropolitan urbanised city, these issues are incredibly relevant. It is important to look at decarbonising alongside colonialisms legacy, as colonialism began the era of global extractivism, with the extraction and trade of natural resources and people. Current research showcases the importance of addressing these topics jointly, as the extractive capitalism perpetuated by many countries and governments today is constructed on a historical foundation of colonialism and carbon use. Addressing these two elements together embraces the EfS approach to sustainability. Decolonising and decarbonising both involve examining the worlds history of extraction in order to meet immediate needs, through a reflexive lens. This is one of the fundamental learning approaches within EfS, as it requires unlearning past behaviours and worldviews in order to imagine new ones. Delving into D&D opens this research up to the exploration of subjects such as climate migration and food security. Colonialism and carbonisation are both historical factors whose impact continue to shape political, environmental and economic systems today.

Exploring intersectional sustainability would also involve taking an in-depth look at climate justice. In order to fully understand intersectional sustainability, one needs to explore how minorities and vulnerable groups are impacted by climate change and how the consequences of the environmental crisis impact them more severely. Equality and equity are important avenues to explore in order to develop more nuanced solutions. The intersections between climate justice and racial justice are a good example of how approaching related concerns in tandem can shed light on overlooked issues minorities face.

An additional avenue of further research could explore ecomodernism and its contrast to community-based change. Ecomodernism in many instances can be regarded as a westernised approach to the environmental crisis. Technology and science are at the helm of this movement, however it rarely takes into account the climate justice elements of sustainability. Ecomodernism often attempts to decarbonise, without considering the need to decolonise, resulting in minimal structural change.





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## Appendix A: Ethics approval letter

**London  
South Bank  
University**

School of  
Applied Sciences

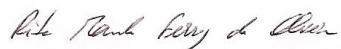
School of Applied Sciences  
103 Borough Rd, London SE1 0AA

Friday 12<sup>th</sup> February 2021

Dear Itumeleng Moeti,

Your ethics application for the research **Education and Food sustainability: an awareness study** recorded under the number SAS21-0001 has received ethical approval from the School of Applied Sciences Ethics Committee on the 10/02/2021. This approval is valid for 2 years.

Kind regards,



Rita De Oliveira

Appendix B: Survey questionnaire

APPENDIX B: Food Sustainability & Sustainability Awareness Survey

SECTION A – Food habits / behaviour

1. Who does the majority of the food shopping in your household? (Please tick)

- Myself
- My partner
- A parent
- A family member
- A housemate

2. How often does your household shop for food? (Please tick)

- Every 1 to 3 days
- Once a week
- Every two weeks
- Once a month

Please state the reasons for your choice:

4. Who does the majority of the cooking in your household? (Please tick)

- Myself
- My partner
- A parent
- A family member
- A housemate

3. Which of the following best describes your attitude to cooking? (Please tick)

- I can't cook and don't want to learn
- I can't cook, but would like to learn
- I don't like cooking
- I don't mind cooking
- Love to cook

5. How would you describe your diet? (Please tick)

- Omnivore diet (Standard diet consisting of meats such as beef, chicken and pork)
- Pescatarian (your diet includes fish and seafood, but no other meat)
- Vegetarian (your diet does not include any meat, but does contain eggs and dairy)
- Vegan (your diet does not include any meat, eggs or dairy)
- Other \_\_\_\_\_

6. If you do eat meat, have you ever consider reducing your meat consumption? YES/NO

6.1) If no, which of the following best describe your motivation? (you may tick more than one)

- Meat is important for good health
- Meat is part of a balanced diet
- Meat is a staple in my culture
- We are made to eat meat
- My meat consumption does not affect the environment
- Alternative diets are expensive
- Not eating meat in my household would be difficult
- I would not know how to prepare meat-free meals
- I don't see any reason to stop eating meat

6.2) If yes, which of the following best describe your motivation? (you may tick more than one)

- Less meat is good for your health
- Less meat would be less expensive
- Less meat is environmentally friendly
- I would eat less meat for weight loss
- Concerns about animal cruelty

SECTION B: Management of food waste

8. How often does your household throw away food?

- Everyday
- 2-4 times a week
- Once a week
- Almost never

9. Which of these food items have you thrown away in the past month? (you may tick more than one)

- Fruits
- Vegetables
- Meat
- Fish
- Bread
- Milk
- Cheese
- Pasta
- Rice
- Legumes (beans, lentils, chickpeas)
- Eggs
- Snacks (chocolate/sweets/crisps)

9.1 (this question will follow) What states was the \_\_\_\_\_ in when you threw it away this month? (you may tick more than one)

- Completely unused (unopened or complete food items)
- Partly used (food disposed of after being opened/partly used)
- Meal leftovers (leftovers from a plate/pot/pan)
- Stored leftovers (leftovers that were disposed of after being stored e.g. in the fridge)

10. What are the main reasons you throw away food? (you can tick more than one)

- I bought too much
- The product expired
- I cook too large a portion
- I find the date labels confusing (sell by/use by/ best before)
- I am not excited to cook
- I never know what to cook
- I do not plan my meals
- I eat out/order in frequently
- Other \_\_\_\_\_

11. Does your household take any steps to reduce food waste? YES/NO

If yes, how does your household manage food waste?

SECTION C: Awareness of sustainability

13. What is your understanding of sustainability?

14. What does food sustainability mean?

15. What are sustainable food practices (please you can tick more than one) / which of these sustainable food practices do you do?

- Buying organic food
- Buying local food
- Buying less food
- Buying seasonal food
- Managing food waste
- Fair trade products

16. When shopping for or preparing food, do you consider how environmentally friendly the products are? (Please tick):

- No, this is not something I consider
- No, I do not know what is considered environmentally friendly
- Yes, some of the time
- Yes, all the time

16. Do you feel a responsibility to be more sustainable? YES/NO

16.1) If yes, what ways do you think you could be more sustainable? (Please write at least 2)

How would you describe your knowledge on food sustainability:

Would you like to learn more about food sustainability and waste management for your home?

If so, which of the following topics would you be most interested in:

If a short course/workshop were offered on food sustainability would you attend?

If yes, for what reason:

Within food sustainability, what do you feel you need more information on? What would you like you know more about?

- How to store food
- How to preserve food
- How to shop better
- How to avoid food waste
- Better meal planning
- Food and climate change
- How to repurpose leftovers

SECTION D: General Information

18. Please select your age range (Please tick)

- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> Up to 19 | <input type="checkbox"/> 50 – 59     |
| <input type="checkbox"/> 20 – 29  | <input type="checkbox"/> 60 – 69     |
| <input type="checkbox"/> 30 – 39  | <input type="checkbox"/> 70 and over |
| <input type="checkbox"/> 40 – 49  |                                      |

19. How would you describe your gender? (Please tick)

- Male
- Female
- Non-binary
- Gender fluid
- Prefer not to say
- Please specify \_\_\_\_\_

20. What is your ethnicity? (Please tick)

- White
- Black
- Asian
- Mixed
- Prefer not to say
- Please specify \_\_\_\_\_

21. Which county of the UK do you live in? (Please tick)

- England
- Northern Ireland
- Scotland
- Wales
- Other \_\_\_\_\_

22. How many members are in our household? (Please tick)

- 1
- 2
- 3
- 4
- 5
- 6+

23. What is your current level of education? (Please tick)

- Higher education
- Further education
- Secondary education
- Primary education
- None

24. What is your current employment status? (Please tick)

- Full-time employed

- Part-time employed
- Self-employed
- Unemployed
- Part-time student
- Full-time student

25. Are you a London South Bank University Student?

- YES
- NO

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**23** How many members are in our household? (Please tick)

How many members are in our household? (Please tick)	How often does your household throw away food in a month?					No answer	Totals
	Everyday	2-4 times a week	Once a week	Every two weeks	Almost never		
1	0.00%	0.00%	1.87%	0.00%	2.80%	0.00%	4.67%
2	0.93%	1.87%	15.89%	2.80%	2.80%	0.00%	24.30%
3	1.87%	5.61%	11.21%	3.74%	3.74%	0.00%	26.17%
4	0.93%	1.87%	14.95%	4.67%	5.61%	0.00%	28.04%
5	0.93%	0.93%	6.54%	0.00%	2.80%	0.00%	11.21%
6+	0.93%	0.93%	2.80%	0.00%	0.93%	0.00%	5.61%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>5.61%</b>	<b>11.21%</b>	<b>53.27%</b>	<b>11.21%</b>	<b>18.69%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
8	107
23	107



# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**23** How many members are in our household? (Please tick)

How many members are in our household? (Please tick)	What are the main reasons you throw away food? (you can tick more than one)									No answer	Totals
	The product is past its 'best before' date	The product is past its 'use by' date	I buy too much	I cook too large a portion	I find the date labels confusing (sell by/use by/ best before)	I never know what to cook	I do not plan my meals	I eat out/order in frequently	Other		
1	0.50%	1.50%	0.50%	0.50%	0.00%	0.00%	0.00%	0.50%	1.00%	0.00%	4.50%
2	1.00%	8.50%	4.00%	3.50%	0.50%	0.00%	2.00%	1.50%	1.50%	0.00%	22.50%
3	4.50%	9.00%	5.50%	3.00%	0.50%	0.50%	3.00%	2.50%	1.50%	0.00%	30.00%
4	2.50%	9.50%	3.00%	5.50%	0.50%	0.50%	1.00%	0.50%	5.00%	0.00%	28.00%
5	0.50%	3.50%	1.00%	2.50%	0.50%	0.50%	0.50%	1.00%	1.00%	0.00%	11.00%
6+	1.00%	1.50%	0.00%	1.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	4.00%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>10.00%</b>	<b>33.50%</b>	<b>14.00%</b>	<b>16.00%</b>	<b>2.00%</b>	<b>1.50%</b>	<b>6.50%</b>	<b>6.00%</b>	<b>10.50%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
10	107
23	107

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

- 12** Please respond to the following statement: "When grocery shopping, I buy items I did not plan to buy because they are on sale"

Please respond to the following statement: "When grocery shopping, I buy items I did not plan to buy because they are on sale"	Please respond to the following statement: "Before grocery shopping, I check what is missing and prepare a list"				No answer	Totals
	Always	Sometimes	Rarely	Never		
<b>Always</b>	8.41%	11.21%	0.93%	0.00%	0.00%	20.56%
<b>Sometimes</b>	23.36%	23.36%	2.80%	0.00%	0.00%	49.53%
<b>Rarely</b>	14.02%	10.28%	1.87%	0.93%	0.00%	27.10%
<b>Never</b>	2.80%	0.00%	0.00%	0.00%	0.00%	2.80%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>48.60%</b>	<b>44.86%</b>	<b>5.61%</b>	<b>0.93%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
<b>11</b>	107
<b>12</b>	107

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**25** What is your current employment status? (Please tick)

What is your current employment status? (Please tick)	Which of the following statements best describes your knowledge on food sustainability:				No answer	Totals
	I have a good understanding of what it is	I have a basic understanding of what it is	I do not fully understand what it is	I do not understand what it is		
Full-time employed	9.35%	29.91%	4.67%	0.93%	0.00%	44.86%
Part-time employed	4.67%	9.35%	2.80%	0.00%	0.00%	16.82%
Self-employed	0.93%	1.87%	0.00%	0.00%	0.00%	2.80%
Unemployed	1.87%	0.93%	0.00%	0.00%	0.00%	2.80%
Part-time student	0.93%	5.61%	0.93%	0.00%	0.00%	7.48%
Full-time student	10.28%	9.35%	4.67%	0.93%	0.00%	25.23%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>28.04%</b>	<b>57.01%</b>	<b>13.08%</b>	<b>1.87%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
14	107
25	107

**25.a** Are you a London South Bank University Student?

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

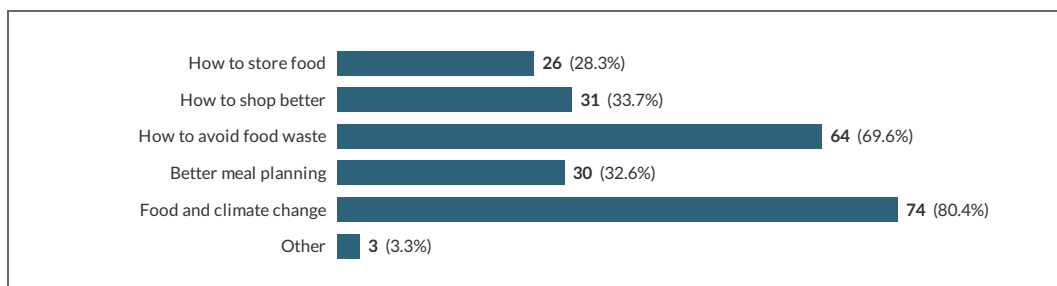
## Use of my information (Please tick the box that applies)

**18** Would you like to learn more about food sustainability for your home?

Would you like to learn more about food sustainability for your home?	Which of the following statements best describes your knowledge on food sustainability:				No answer	Totals
	I have a good understanding of what it is	I have a basic understanding of what it is	I do not fully understand what it is	I do not understand what it is		
<b>YES</b>	21.50%	51.40%	12.15%	0.93%	0.00%	85.98%
<b>NO</b>	6.54%	5.61%	0.93%	0.93%	0.00%	14.02%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>28.04%</b>	<b>57.01%</b>	<b>13.08%</b>	<b>1.87%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
14	107
18	107

**18.a** Which of the following topics would you be interested in? (you may tick more than one)



1 / 2

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**5** Who does the majority of cooking in your household?

Who does the majority of cooking in your household?	Who does the majority of the food shopping in your household? (Please tick)					No answer	Totals
	Myself	My partner	A parent	A family member	A housemate		
<b>Myself</b>	57.94%	1.87%	0.93%	0.00%	0.00%	0.00%	60.75%
<b>My partner</b>	5.61%	11.21%	0.00%	0.00%	0.00%	0.00%	16.82%
<b>A parent</b>	0.93%	0.93%	8.41%	0.00%	0.00%	0.00%	10.28%
<b>A family member</b>	1.87%	2.80%	0.93%	2.80%	0.00%	0.00%	8.41%
<b>A housemate</b>	2.80%	0.00%	0.00%	0.00%	0.93%	0.00%	3.74%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>69.16%</b>	<b>16.82%</b>	<b>10.28%</b>	<b>2.80%</b>	<b>0.93%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
3	107
5	107

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**4** How often does your household shop for food? (Please tick)

How often does your household shop for food? (Please tick)	What are the main reasons you throw away food? (you can tick more than one)									No answer	Totals
	The product is past its 'best before' date	The product is past its 'use by' date	I buy too much	I cook too large a portion	I find the date labels confusing (sell by/use by/ best before)	I never know what to cook	I do not plan my meals	I eat out/order in frequently	Other		
Every 1 to 3 days	1.00%	10.00%	3.00%	4.00%	0.50%	0.50%	2.50%	3.50%	3.00%	0.00%	28.00%
Once a week	9.00%	22.50%	11.00%	11.50%	1.50%	1.00%	3.00%	2.50%	7.00%	0.00%	69.00%
Every two weeks	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	0.50%	0.00%	2.00%
Once a month	0.00%	0.50%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>10.00%</b>	<b>33.50%</b>	<b>14.00%</b>	<b>16.00%</b>	<b>2.00%</b>	<b>1.50%</b>	<b>6.50%</b>	<b>6.00%</b>	<b>10.50%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
10	107
4	107

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**23** How many members are in our household? (Please tick)

How many members are in our household? (Please tick)	How often does your household shop for food? (Please tick)				No answer	Totals
	Every 1 to 3 days	Once a week	Every two weeks	Once a month		
1	1.87%	2.80%	0.00%	0.00%	0.00%	4.67%
2	7.48%	16.82%	0.00%	0.00%	0.00%	24.30%
3	9.35%	14.95%	1.87%	0.00%	0.00%	26.17%
4	5.61%	21.50%	0.00%	0.93%	0.00%	28.04%
5	2.80%	7.48%	0.93%	0.00%	0.00%	11.21%
6+	0.93%	3.74%	0.93%	0.00%	0.00%	5.61%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>28.04%</b>	<b>67.29%</b>	<b>3.74%</b>	<b>0.93%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
4	107
23	107

# Food Sustainability & Sustainability Awareness

Showing 107 of 107 responses

Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**19** Please select your age range (Please tick)

Please select your age range (Please tick)	How would you describe your diet? (Please tick)					No answer	Totals
	Omnivore diet (Standard diet including meats such as beef, chicken and pork)	Pescatarian (your diet includes fish and seafood, but no other meat)	Vegetarian (your diet does not include any meat, but does contain eggs and dairy)	Vegan (your diet does not include any meat, eggs or dairy)	Other		
18 - 29	20.56%	1.87%	7.48%	4.67%	0.00%	0.00%	34.58%
30 - 39	34.58%	1.87%	3.74%	1.87%	0.93%	0.00%	42.99%
40 - 49	10.28%	0.93%	0.93%	0.00%	0.00%	0.00%	12.15%
50 - 59	6.54%	0.00%	0.00%	0.00%	0.00%	0.00%	6.54%
60 - 69	2.80%	0.00%	0.00%	0.00%	0.00%	0.00%	2.80%
70 and over	0.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.93%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>75.70%</b>	<b>4.67%</b>	<b>12.15%</b>	<b>6.54%</b>	<b>0.93%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
7	107
<b>19</b>	<b>107</b>



# Food Sustainability & Sustainability Awareness

Showing 107 of 107 responses

Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**20** How would you describe your gender? (Please tick)

How would you describe your gender? (Please tick)	How would you describe your diet? (Please tick)					No answer	Totals
	Omnivore diet (Standard diet including meats such as beef, chicken and pork)	Pescatarian (your diet includes fish and seafood, but no other meat)	Vegetarian (your diet does not include any meat, but does contain eggs and dairy)	Vegan (your diet does not include any meat, eggs or dairy)	Other		
Male	22.43%	0.93%	3.74%	0.00%	0.00%	0.00%	27.10%
Female	53.27%	3.74%	7.48%	6.54%	0.93%	0.00%	71.96%
Non-binary	0.00%	0.00%	0.93%	0.00%	0.00%	0.00%	0.93%
Prefer not to say	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>75.70%</b>	<b>4.67%</b>	<b>12.15%</b>	<b>6.54%</b>	<b>0.93%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
7	107
20	107

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**19** Please select your age range (Please tick)

Please select your age range (Please tick)	If you do eat meat, have you ever consider reducing your meat consumption?		No answer	Totals
	YES	NO		
18 - 29	16.82%	5.61%	12.15%	34.58%
30 - 39	24.30%	12.15%	6.54%	42.99%
40 - 49	9.35%	1.87%	0.93%	12.15%
50 - 59	1.87%	4.67%	0.00%	6.54%
60 - 69	1.87%	0.93%	0.00%	2.80%
70 and over	0.93%	0.00%	0.00%	0.93%
No answer	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>55.14%</b>	<b>25.23%</b>	<b>19.63%</b>	<b>100.00%</b>

Question	Response count
7.b	86
19	107

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**20** How would you describe your gender? (Please tick)

How would you describe your gender? (Please tick)	If you do eat meat, have you ever consider reducing your meat consumption?		No answer	Totals
	YES	NO		
<b>Male</b>	12.15%	11.21%	3.74%	27.10%
<b>Female</b>	42.99%	14.02%	14.95%	71.96%
<b>Non-binary</b>	0.00%	0.00%	0.93%	0.93%
<b>Prefer not to say</b>	0.00%	0.00%	0.00%	0.00%
<b>Other</b>	0.00%	0.00%	0.00%	0.00%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>55.14%</b>	<b>25.23%</b>	<b>19.63%</b>	<b>100.00%</b>

Question	Response count
<b>7.b</b>	86
<b>20</b>	107

**20.a** If you selected Other, please specify:

*No responses*

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**19** Please select your age range (Please tick)

Please select your age range (Please tick)	If yes, which of the following best describe your motivation? (you may tick more than one)						No answer	Totals
	Less meat is good for your health	Less meat would be less expensive	Less meat is environmentally friendly	I would eat less meat for weight loss	Concerns about animal cruelty	Other		
<b>18 - 29</b>	4.93%	1.97%	6.40%	3.45%	4.43%	0.49%	9.36%	31.03%
<b>30 - 39</b>	8.87%	7.39%	9.85%	1.97%	5.42%	0.99%	9.85%	44.33%
<b>40 - 49</b>	4.93%	2.96%	3.45%	1.97%	1.97%	0.00%	1.48%	16.75%
<b>50 - 59</b>	0.99%	0.00%	0.49%	0.49%	0.49%	0.00%	2.46%	4.93%
<b>60 - 69</b>	0.99%	0.49%	0.49%	0.00%	0.00%	0.00%	0.49%	2.46%
<b>70 and over</b>	0.49%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.49%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>21.18%</b>	<b>12.81%</b>	<b>20.69%</b>	<b>7.88%</b>	<b>12.32%</b>	<b>1.48%</b>	<b>23.65%</b>	<b>100.00%</b>

Question	Response count
7.b.ii	59
<b>19</b>	<b>107</b>

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**16** When shopping for food, do any of the following impact what you buy? (you may tick more than one)

When shopping for food, do any of the following impact what you buy? (you may tick more than one)	When shopping for or preparing food, do you consider how environmentally friendly the products are? (Please tick):				No answer	Totals
	No, this is not something I consider	No, I do not know what is considered environmentally friendly	Yes, some of the time	Yes, all the time		
Buying organic food	3.26%	0.47%	12.56%	1.86%	0.00%	18.14%
Buying locally produced food	3.26%	1.40%	22.79%	2.33%	0.00%	29.77%
Buying seasonal food	1.86%	1.86%	20.93%	2.79%	0.00%	27.44%
Buying fair trade products	2.33%	1.40%	13.49%	0.93%	0.00%	18.14%
None of the above	5.12%	0.47%	0.93%	0.00%	0.00%	6.51%
No answer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>15.81%</b>	<b>5.58%</b>	<b>70.70%</b>	<b>7.91%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
15	107
16	107

# Food Sustainability & Sustainability Awareness

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Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**19** Please select your age range (Please tick)

Please select your age range (Please tick)	When shopping for food, do any of the following impact what you buy? (you may tick more than one)					No answer	Totals
	Buying organic food	Buying locally produced food	Buying seasonal food	Buying fair trade products	None of the above		
<b>18 - 29</b>	6.98%	9.77%	9.77%	6.51%	2.79%	0.00%	35.81%
<b>30 - 39</b>	7.91%	13.95%	12.09%	6.51%	2.33%	0.00%	42.79%
<b>40 - 49</b>	2.79%	2.79%	2.33%	3.26%	0.93%	0.00%	12.09%
<b>50 - 59</b>	0.47%	2.33%	2.33%	0.93%	0.00%	0.00%	6.05%
<b>60 - 69</b>	0.00%	0.47%	0.47%	0.47%	0.47%	0.00%	1.86%
<b>70 and over</b>	0.00%	0.47%	0.47%	0.47%	0.00%	0.00%	1.40%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>18.14%</b>	<b>29.77%</b>	<b>27.44%</b>	<b>18.14%</b>	<b>6.51%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
<b>16</b>	107
<b>19</b>	107

# Food Sustainability & Sustainability Awareness

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Showing **all** responses

Hiding **25** questions

Response rate: 107%

## Use of my information (Please tick the box that applies)

**19** Please select your age range (Please tick)

Please select your age range (Please tick)	When shopping for or preparing food, do you consider how environmentally friendly the products are? (Please tick):				No answer	Totals
	No, this is not something I consider	No, I do not know what is considered environmentally friendly	Yes, some of the time	Yes, all the time		
<b>18 - 29</b>	6.54%	2.80%	22.43%	2.80%	0.00%	34.58%
<b>30 - 39</b>	11.21%	0.93%	28.97%	1.87%	0.00%	42.99%
<b>40 - 49</b>	4.67%	1.87%	4.67%	0.93%	0.00%	12.15%
<b>50 - 59</b>	1.87%	0.93%	3.74%	0.00%	0.00%	6.54%
<b>60 - 69</b>	0.00%	0.00%	2.80%	0.00%	0.00%	2.80%
<b>70 and over</b>	0.00%	0.00%	0.93%	0.00%	0.00%	0.93%
<b>No answer</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Totals</b>	<b>24.30%</b>	<b>6.54%</b>	<b>63.55%</b>	<b>5.61%</b>	<b>0.00%</b>	<b>100.00%</b>

Question	Response count
<b>15</b>	107
<b>19</b>	107