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University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

An Analysis of People's Behaviours and Attitudes to Food Consumption and Waste in the Cork Region

Michelle Sweeney

CARL Research Project

in collaboration with

Stop Food Waste Challenge

CARL
COMMUNITY - ACADEMIC
RESEARCH LINKS
University College Cork, Ireland

Name of student(s):	Michelle Sweeney
Name of civil society organisation/community group:	Stop Food Waste Challenge
Name of community group liaison person:	Donal O'Leary
Academic supervisor(s):	Ronan O'Farrell
Name and year of course:	Msc Food Business
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What is Community-Academic Research Links?

Community Academic Research Links (CARL) is a service provided by research institutes for the Civil Society Organisations (CSOs) in their region which can be grass roots groups, single issue temporary groups, but also well-structured organisations. Research for the CSOs is carried out free of financial cost as much as possible.

CARL seeks to:

• provide civil society with knowledge and skills through research and education;

• provide their services on an affordable basis;

• promote and support public access to and influence on science and technology;

• create equitable and supportive partnerships with civil society organisations;

• enhance understanding among policymakers and education and research institutions of the research and education needs of civil society, and

• enhance the transferrable skills and knowledge of students, community representatives and researchers (www.livingknowledge.org).

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Why is this report on the web?

The research agreement between the CSO, student and CARL/University states that the results of the study must be made public. We are committed to the public and free dissemination of research results.

How do I reference this report?

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Chapter I: Introduction

1.1 Introduction:

Annually, there is an estimated 88 million tonnes of food wasted throughout the EU and if there is nothing done it could rise to 120 million tonnes by 2020 a mere three years away from now (EC-Fusions, 2016). The wastage of food has many problems associated with it although it is an ethical and economic issue, it also has a major impact on the environment as it depletes natural resources (EC-Fusions, 2016). Economically, it represents a wasted investment leading to reduced farmer's income and increased costs to the consumer. Its impact on the environment has many hidden implications such as the unnecessary emission of greenhouse gases and the inefficient use of water and land. These effects may lead to diminished natural ecosystems. This research will look at the issue surrounding food waste, what is food waste and why it is important to reduce food waste for the future (Kamal-Chaoui & Alexis, 2009). This research will also focus on the food policy in countries such as France and in the UK and will look at the initiatives these countries are planning to do. It will also examine what's already in place to tackle the food waste problem in each of their countries. Another issue this research will deal with is the actors and drivers that are contributing to the food waste along the supply chain and finally the paper will discuss the environmental factors and the negative effects food waste has on our environment.

1.2 Background

Numerous studies and literature have investigated what has been causing the alarming rates of food losses and waste in the global food supply chain. There has been an increased concern in the amount of food waste amongst consumers in the household and why this problem continues to grow.

1.3 Justification

There is now more than ever before an emphasis on the amount of food we eat as consumers and the amount of food that is wasted in the process. This is an emerging and important topic in food business and development and therefore the topic meets the criteria for research. The covered topics in this research include what food waste is, why we need to reduce food waste, the main trends that influence food waste and effects food waste has on the environment. It

will also cover the development of food waste policies in other countries, the results of research carried out and conclusions and recommendations. These areas give an overview of people's behaviours and attitudes to food waste and consumption.

1.4 Research Objective

There has been an increase in awareness of food waste and losses amongst food businesses and consumers over the past number of years. This is an emerging topic in the field of food business and development, and therefore the chosen topic meets the criteria for research. The topics covered in this research include, identifying what food waste is? what causes food waste, identifying the environmental effects food waste has, examining other countries food waste policies and how they seek to reduce food waste. The research sets out to find out from consumers their view on their own habits and look at food consumption and waste amongst their household.

1.5 Research Questions

The research question aligns closely with the research objectives and can be defined as follows:

- What are the main causes of food waste along the food supply chain?
- What effects does food waste have on the environment in the long term?
- What factors lead consumers to waste a high volume of food in the household?
- What measures can be taken to influence more consumers to be more aware of the effects food waste has on them?

1.6 Research Limitations

The dissertation has the objective to give a coherent overview about people's behaviours and attitudes towards food waste and consumption as a research area. Due to the size and amount of literature available, the literature review will not be able to provide a holistic and conclusive investigation in all the research areas. Furthermore, this research was completed with a limited sample and is not as extensive as would be required to have a conclusive review of the issues involved in food waste. One of the main limitations in this piece of research was time. The study was completed over a nine-month period whilst the researcher was working full time in

a busy office environment. The small sample size and the use of quantitative research methods means that the generalisability of the findings is somewhat limited Due to this and several aspects may not be covered or reviewed at all.

1.7 Methodology

Scientific data bases and online data research were used to collect the data and to ensure a diversified and consistent method of data acquisition. The search tools used to gather the information for the literature review included google scholar, science direct and the online journal database. Books from the library were also used in this research. To ensure consistency amongst the material, journals and well established sources were only used in the literature. The search range included the years 2004 to 2017 to ensure a more up to date review of the relevant material.

1.8 Summary

This research investigated a coherent introduction into the different key aspects involved in people's behaviour and attitudes to food waste and consumption. In more detail, it looked at the causes associated with food waste and why there needs to be more done to influence consumers to reduce the amount of food waste from their households. Furthermore, the literature looked at the main actors of food losses and two factors that have an influence in food waste. We saw from this that, consumers have a lot more time constraints and are more likely to eat outside the home or use a take away service for more convenience. It also looked at the date labelling on food packaging and how often this can be misinterpreted by consumers. Often or not these dates are more of a guideline and frequently food is thrown out even though it is not spoilt, but because the date states on it that it is passed its use by date. It also looked at the impact food waste has on the environment and the damage it is doing to the soil as consumer's demand more high-quality food all year round. In addition to this it looked at the countries who have put policies in place now to try and help elevate food waste in their countries. The understanding of these key aspects and what studies have found will be needed to develop new policies and initiatives to encourage consumers to be more educated in tackling food waste going forward.

Chapter II: Food Waste and Why We Need to Reduce It

2.1 Introduction:

According to, the Food and Agricultural Organisation (FAO), one third of the world's food produced is wasted or lost along the food supply chain. In relation to this there is several factors and trends that could essentially lead to the high level of waste and losses in the food chain. According to, Stenmarck et al., 2016 there is a substantial amount of food wasted from farm to fork and that 53% of EU households contribute to this high level of food wasted in the value chain. This alarming rate calls for increased attention towards finding new ways of intervening into food waste practices amongst households (Hebrok & Boks, 2017). Recent research has extensively mapped amounts, composition and demographic variables, as well as social and cultural antecedents of food waste (Porpino et al, 2015). As people are becoming more aware of the levels of food waste that is occurring, more interest has spawned in local groups to educate consumers. These groups educate consumers how to reduce food waste and to become more mindful and conscious on their food purchases and waste. This chapter sets out to explore what food waste is and how it could be a missed opportunity in solving global issues of food insecurity. Following on from this, the chapter will explore the reasons why there is an increasing need to reduce the amount of food we waste.

2.2 What is Food Waste?

In 2011 the FAO conducted a survey assessing the global food losses and waste. The study found that each year, around one-third of all food produced for human consumption in the world is either lost or wasted. Grown but uneaten food puts huge pressure on the environment and economical costs. All this significant waste has proven that there has been a missed opportunity in solving the global issues of food security. According to, Alexandratos & Bruinsma 2012 by 2050 food production will need to increase up to 60 percent of that in 2007 and 2008 to meet the increasing demand. All this will mean that production will need to make better use of the food that is already available.

Food waste is often defined into two categories avoidable and unavoidable. In industry, avoidable food waste often comprises of damaged stock and products that were not used for the matter intended (Bagherzadeh et al, 2014). There are several reasons why avoidable food

waste occurs which can result in the over purchase of a good, poor preparation, inadequate food storage and excessive portion sizes. While avoidable food waste can be reduced with better planning, whereas unavoidable food waste is a separate issue which describes food being inedible or unsellable. Examples of these types of food are fats, bones, and skins off meat, eggshells, fruit and vegetable peels. Although, these terms could be deemed useful in waste management, the terms are subject to interpretation by individuals and governments so are, therefore not universally accepted.

2.3 Why Reduce Food Waste?

In recent times, food waste has been holding the potential to combating the global problem of food scarcity for millions of people who remain undernourished around the world. Although, reducing the levels of food waste in developed countries may not fully tackle the problem of food insecurity in developing countries, it would see the reduction for the competition of water, land and biodiversity uses, making these resources available for other uses (Bagherzadeh et al, 2014). There is a great opportunity for edible food that is usually wasted to be redistributed to the food insecure populations.

Tackling food waste needs to be top priority going forward for governments in the next number of years. The FAO 2013 has recognised that such large quantities of food are being wasted annually and could be as much as 2 billion tonnes a year. They believe that this is contributing to the global carbon footprint of waste which is at 3.3 billion of CO2 emissions and is contributing to 7% of the world's output. The FAO 2013 estimated also that the value of food waste was costing $750 billion at producer cost level. This is due to the value of food increasing throughout the supply chain, but the actual economic value of food waste is deemed to be much higher. With these high volumes of food waste being produced annually, the local governments are finding themselves under increased pressure financially to collect and treat the waste. The EPA (2014) estimate that the UK gate fees and landfill taxes are amounting to around $450 million a year just to dispose of household food waste. Taking these huge costs into consideration is some of the reasons why the issue of food waste needs to be tackled sooner rather than later.

As already mentioned if the issue is not soon taken into consideration and tackled it is likely that food waste could significantly rise because of the rising population, the rapidly growing middle class and changes in the diets of consumers. By 2030, it is estimated that the global middle class population will more than double to 5 million people (Kharas, 2010). As evidence is suggesting, the middle-class population in developing countries are adopting the diets and habits of those in the developed world, therefore it is estimated that there could be an additional 280 million tonnes of food waste generated per annum which would see the figures gathered in 2011 doubling (United Nation, 2013). The effects that food waste has on the environment is another issue of concern. Food waste must be put somewhere and using landfills in many countries around the world is leading to the high levels of methane gas being produced. According to the FAO report in 2013, food that is produced and not eaten is accounting for 3.3 billion tons of greenhouse gases to the Earth's atmosphere which makes food wastage the third top emitter after the USA and China (FAO 2013).

Food waste has an impact on the economic aspect also. By reducing food waste, it can increase the efficiency of the food supply chain, bring economic benefits which includes lower costs for businesses and lower prices for customers (OECD, 2014). New businesses have been developed to turn what would have been potentially waste into inputs for new products. Here in Ireland new companies have started up that collect food that is almost expired from local supermarkets and business which is then redistributed to local charities around the country. Bia Food Initiative is an example of a company set up to help charities and those who are stricken with poverty.

The OECD Food Chain Analysis Network in June 2013, repeatedly raised the issues of the importance of reducing food waste to increase the efficiency of the food supply chain from the social, environmental and economic view. Rising population, increasing incomes and different dietary preferences are rapidly increasing and putting greater pressure on the food supply chain. There is great potential to provide more food by reducing waste, freeing up land, water and energy for other uses. The need to find these opportunities, requires the understanding of patterns and the actual scale of the food waste throughout the supply chain, the incentives and disincentives directed to businesses and consumers, and the policy and regulatory framework on food waste (Bagherzadeh et al, 2014).

When looking at benefits of reducing food waste, it is relatively easy to see the immediate effects and benefits to consumers and businesses when they reduce their own waste, but it is potentially more difficult to calculate the real cost it would have globally. The UK has seen the positive role the WRAP initiative has had in the household, it has led to consumers to be more conscious of their food purchases and food waste. Opportunities currently exist in the food industry to innovate around value added foods and to possibly make savings from the reduction of food waste in the supply chain. WRAP 2014 suggest that half of UK consumers used their food waste savings to 'trade up' and buy more expensive food and drink while the other half was used on other goods and services.

With many benefits allowing for the reduction of food waste it remains to be seen why not more is being done to reduce food waste. Taking the UK's WRAP initiative into account, it shows how reducing food waste can be done. Many believe that reducing waste initiatives are costly but the figures suggest that quite frankly wasting food is having more cost on the economic and environmental factors in the world. It is time for more governments around the world to set up policies that will allow their countries population to consider their over purchasing of food and highlight the need to reduce their food waste annually.

2.4 Summary

In summary, many factors equate to why food waste needs to be reduced and the various sources of food waste and losses within the food supply chain. The FAO 2013 figures show just how much food waste is costing and the effects it is having on our global system. The OECD Food Chain Analysis Network in June 2013, repeatedly raised the issues of the importance of reducing food waste to increase the efficiency of the food supply chain from the social, environmental and economic view. By reducing food waste, it can increase the efficiency of the food supply chain, bring economic benefits which includes lower costs for businesses and lower prices for customers. The UK has seen the positive role the WRAP initiative has had in the household, it has led to consumers being more conscious to their food purchases and food waste. Looking at these ways to help reduce our waste can in turn have huge benefits for consumers going forward in the future.

Chapter III: The main trends that influence food losses

3.1 Introduction

Until recently, food waste has been largely ignored due to the abundance of food. This has led to major amounts of waste, mainly at primary production and consumer levels (European Parliament 2011). Food consumption has been identified as one of the most resource demanding and polluting activities within a household (Carlsson-Kanyama 1998). The Rockefeller foundation 2013 identified that food loss reduces the income in a developing country by fifteen per cent for 470 million smallholder farmers and downstream value chain operators. This equates to some of the 1.2 million people in the world who are food insecure.

Essentially, there are many drivers of the food waste generation and it is thought to be from residential, institutional and commercial sectors, although there is a lack of detailed information to thoroughly identify the exact cause. In the developed world, particularly in the USA, Rozin 2005 identified how food has become more affordable and accessible. Food has also increased in volume, and is caloric dense essentially leading to the overconsumption and waste of food. There tends to be very little understanding of what food is, where it comes from and what the production entails (Stuart 2009).

Consumers tend to over purchase food because of special offers attracting them to buy more than they need (Story & French, 2004). As well as that many consumers do not have the proper storage for their bulk purchase leading to the food going bad and hence contributing to high volumes of food waste (Chandon & Wansisk, 2012). Personal reasons and culture can effectively influence one's decisions regarding what is too good to throw away. The food waste generation is a function of cultural, personal, political, geographical, and economic forces that influence the behaviour in certain ways. Although it can differ across different societies, change between people and differ over the course of even a year (Bonaccorsi, 2015)

3.2 Increase in consumers eating out of the home

The industrialisation of the food supply chain has seen the transition of how the production of food has changed over the last number of years. There has been a shift on how people are

consuming their food which has included more people eating outside of the home and spending less time preparing food. In areas where there is a high level of food processing, consumers tend to purchase readymade meals, canned goods and frozen foods. These purchases essentially lead to by-products, which is contributing to increased volumes of industrial waste. Patricianly, these goods require special packaging to make them non-perishable items, and the volumes of household waste becomes significantly higher.

In recent years, there has been a big upsurge in the market for consumers eating out in restaurants and using take away services. Thyberg 2016 identifies that more consumers are eating out due to most households having two earners. This is due to the lack of time they hold to participate in food preparation, and the busy modern lifestyle they now hold. Due to the increased number using restaurants it is now more than likely than ever, that the food industry will account for dramatic rise in the contribution of food waste. The USDA estimates that almost half of the US food budget is currently being spent on eating away from home. This is a dramatic rise for the early twenty first century from where nearly all the food budget was spent on preparing food at home (USDA 2013). Strasser 1999, found that adults were less likely to waste food that was prepared in the home. He also noted that people who did not spend time creating or preparing food, were far more likely to waste the food as they held little value in the labour that was used to produce the product.

WRAP in the UK identified the main causes that equates to the food waste problem in the hospitality and food service sector which included over preparation of food, consumers leaving uneaten food, the menu and the large portion sizes. In the food sector, it is widely accepted that one size portion fits all which is causing many consumers to order food they know they are not going to eat and it ends up being discarded. From experience, the food portions that are being served far exceed the food that we need to eat. Consumers expect value for money and in the case of being served a small portion it is likely to cause a perception of bad value for money. The food wastage within the hospitality and food sector illustrates a lack of detailed knowledge and awareness around the impact food waste is having.

3.3 Date Labelling

Many critics argue that the issue leading to food waste is the food date labelling system (Wilson and Rickard 2016). Best before dates were initially stamped on foods to inform consumers of the freshness and the safety of the food they are going to consume. The NRDC 2013, believe that these date labels are confusing and misleading to consumers as they do not truly reflect the freshness and quality of the product. In addition, to the NRDC beliefs, critics also argue that date labels are confusing for consumers and this confusion encourages unnecessary levels of food waste (Wansink and Wright, 2006). Kantor et al (1997) suggest that consumers dispose food products as they are near their end of life for perceived food safety reasons. These dates are only put on the packaging by the manufacturer as a guideline to when they believe the product is at its peak quality. A study carried out by WRAP 2011, found that one fifth of food thrown away by households in the United Kingdom because it was perceived as being 'out of date' due to the information on the label, when in fact the food was still suitable for human consumption. Perhaps, there is a way in which a system could potentially help reduce this unnecessary food wastage of providing consumers with a more specific dating system so that they become more knowledgeable in the fight against food waste.

Food safety concerns are the primary concern for human health and governments realising that food labelling contributes to food waste. This could be a reason behind why there is not more guidelines and regulations around food labelling. Still, the European Union and the USDA are compassionate about reducing food waste but have not yet developed strategy and guidelines around the topic as of yet. Currently the USDA is working on a donation system that will allow the redistribution of food that is fit for human consumption to charities. As mentioned earlier, the BIA food initiative here in Ireland is one example of a redistribution charity that is working closely with businesses to help cut down on the edible food that is unnecessarily wasted each day.

3.4 Summary

In summary, this chapter looked at the contributors to increased food waste in the supply chain. Rozin 2005, highlighted the affordability of food in the USA and how food has become more accessible for consumers who tend to over purchase food items in their food shop. The chapter also looked at the higher volume of people eating outside of the home. Thyberg 2016 identifies

that more consumers are eating out due to most households having two earners. The lack of time they hold to participate in food preparation and busy modern lifestyle they now hold contributes to food being consumed outside the family home. As there is a lack of data and detailed knowledge around the hospitality sector, it remains unknown what the real main causes of food waste in this sector are. The chapter examined date labelling of food as being an issue for food waste. The NRDC 2013, believe that date labels are confusing and misleading to consumers as they do not truly reflect the freshness and quality of the product. In addition, to the NRDC beliefs, critics also argue that date labels are confusing for consumers and this confusion encourages unnecessary levels of food waste (Wansink and Wright, 2006).

Chapter IV Environmental effects of food waste

4.1 Introduction

Food waste is a large contributor of environmental damage, but food production and consumption are also very reliant on the natural resources in our environment especially water, land and the flora and fauna (FAO, 2013). Lang and Heasman 2013 explain how the food infrastructure is under great strain because of the misuse of land and wasteful systems of farming, processing, distribution and consumption. Many resources in nature are used to firstly produce the food. When the food is not consumed, the food must be sent to landfills to decay over a number of years. It has been identified that the consumers in developed societies over eat and completely under value the surplus of food and how much damage it is doing to the environment (Parfitt et al 2010). Food wastage accounts for a missed opportunity that could essentially lead to improving the world's food insecurity and essentially lessen the environmental impact caused by agriculture. With the population set to increase by 2050, making use of the world's entire food supply would essentially lead to better use of resources, helping with the future demand needed. The FAO 2013 recognised that food production, processing, marketing, consumption and disposal have important environmental externalities because of energy and natural resources usage and the association of greenhouse gas emissions.

4.2 The effects of food waste on the natural environment

Natural resources are used throughout the production of food in the supply chain leading to food waste to occur at all stages throughout the chain. Interestingly, the major part of food waste at the agricultural stage seems to happen where the soil is experiencing a certain level of degradation (FAO, 2013). The regions where this occurs are normally poor and the land degradation is causing the countries food insecurity (Blum, 2013). Biodiversity in food waste is also considerable because the land is farmed heavily and it is often the farmers only source of income thus leading to the land being depleted of its natural minerals. Often crops do not reach their full growth and are therefore often rejected by the food companies as they do not meet the specifications for food production (FAO, 2013).

In addition, the wastage of water and other limited resources is a cause for concern because these resources are used to produce the food that at the end of the supply chain is not consumed

(FAO, 2011). If richer countries discarded less food, it would allow for the agricultural land and possibly other resources to grow for consumption in the developing countries. It has been identified that the food waste in the developed countries has led to the problem of global hunger. All the food produced globally is sold to the global trade markets. As developed countries are wasting the food, it is removed from the markets which potentially could have been used to feed other nations that are suffering from food insecurity. The rising demand for food in developed countries, has contributed to the rise in food prices which in turn makes the food too expensive for the poorer nations (FAO, 2013).

For food waste to be tackled effectively there is a need to identify the world's largest generators of food wastage and which types of food are being wasted the most, so this identification can lead to better management of land (Lyon & Ramachandran, 2013). The huge growth in the urbanisation of land has led to the aspiration of the 21st century generation, delivering good quality food to everyone. Consumers expect a high level of choice and variety when it comes to food purchases leading to a high level of food on supermarket shelves not even being purchased (Wansisk and Wright, 2006). As consumers, we consume our own environment because all food comes from some aspect in the environment whether it be plant, animal or seeds. Food chains have now become more complex; the environmental impact has become more spread out across the chain. All this has contributed to a lesser appreciation for the environment (Popkin et al, 2012). Yet as consumers we are completely oblivious to what we are potentially eating and where it has come from. The increased reliance on the food system in the environment has become a major driver of land erosion and destruction.

Different foods require different levels of natural resources. An example would be a tomato requires 13 litres of water to grow and an animal to rear for beef requires 7,000 litres (FAO 2013). The impact food has on the emission of greenhouse gases depends both on volume and the method in which the food was produced. The greenhouse gas emission in relation to fruit and vegetables is a lot higher due to the more waste it produces. The environmental cost of food waste is huge which makes tackling the problem more of an urgent priority, because the planet has reached its environmental limits and the natural resources globally are becoming much scarcer. Tackling the issue needs to be more informative to consumers globally with tactful campaigning, communicating and highlighting the important ways that can help reduce

food waste throughout the supply change and especially at retail and household level (FAO, 2013).

4.4 Summary

In summary, this chapter focused on the environmental impact of food waste. The FAO, 2011 stated that the wastage of water and other limited resources is a cause for concern because these limited resources are used to produce the food that is at the end of the supply chain not consumed. It examined at how there is more demand from consumers to expect high quality foods all year round. Food chains have now become more complex and we as consumers are consuming our environment. There is a greater need for consumers to be educated and informed more effectively on how to save our environment by looking to reduce our food waste.

Chapter V: Development of Food Waste Policy

5.1 Introduction

Across the world there is no universal policy for food waste and prevention. Different countries have their own policies and more are coming on stream to try and tackle the global issue of food waste. Several countries including Denmark, France, Ireland, UK, Sweden, Japan and Australia have all developed policy in relation to finally tackling the growing problem of food waste amongst their populations. This chapter will focus on the policies that have been developed by Japan, France and the UK in their combat to tackle food waste. The chapter will also look at the FareShare initiative developed in conjunction with Tesco where food that is near its end of shelf life is donated to charities. The food is distributed to people who are stricken with poverty. This initiative helps feed people that are hungry and helps to reduce Tesco's food waste.

5.2 Countries with Food Waste Policy in Place

Consumer's health and food safety are mainly the focus of regulator's attention and it has led to ongoing debate focusing around the obligation to ensure food safety for consumers and the desire to reduce food waste (Aschemann-Witzel et al 2015). In Japan, to promote recycling habits, the food waste is used as an input into the animal feed processing industry, showing where a productive use of food is used whether it would have been otherwise lost (FAO, 2011). There has been an increased focus on the waste that households and consumers produce. Many initiatives developed in countries are specifically targeted towards consumers as it is allowing for consumers to become more conscious of their food purchases and waste habits. In some countries, they are developing strategies and incorporating them into schools to teach children and youths how not to waste food and recycle.

In the European Union, there is no universal set of regulations for the member states, each country in the EU has their own set of regulations to deal with food waste. The General Food Law Regulation lays down the definitions, principles and obligations covering all stages of food and feed production and distribution (Bagherzadeh et al, 2014). The waste framework directive developed for the countries in the EU, offers guidelines towards the management of waste. It identifies the legal minimum targets for recycling, recovery rates and sets landfill

diversion targets. These two frameworks set the legislation which influence the generation of food waste, but it also clearly discriminates against the possible uses of food waste for other multiple uses that could very well be easily explored by members of parliament. The EU animal by-products regulation outlines the health rules regarding animal by-products and derived products are not fit for human consumption. A component of the EU framework highlights an area for action on food waste. The Roadmap to a Resource Efficient Europe sets out targets to be reached by 2050 and a comprehensive evaluation in 2020 (European Commission).

In 2015, French policy makers released their plans to roll out a National Policy against food waste, offering ideas for prevention, recovery and recycling. Measures that are mentioned in the plan include a ban on supermarket food waste, which has now entered the legislative stages and is just one of the thirty-six measures included in the policy. The French Member of Parliament found that 300 pounds of food, was wasted per person each year. This highlights the crisis in food production and in consumption systems. In a context of limited resources, fighting food waste is viewed as integral to building a more ethical society (Mourad 2015).

The proposed policy document comprises of thirty-six proposals which are organized into three groups. The first group covers the actions needed to be undertaken by various stakeholders in the food system which includes the producer, processors, retailers, and restaurants. The second group addresses aspects of which are needed to implement the policies, which will see the development of a specialized agency. One thousand community service positions will be created which will focus on food waste. The third proposes a new model of policy creation and government related to the European Union and to International institutions (Mourad 2015).

The National Resources Defence Council (NRDC) 2015 found that enough food is now produced in the world to feed everyone, and the report states that wasting food is not only an environmental and economic concern but also an ethical concern. There needs to be clear emphasis of responsibility put on each organisation and each individual citizen to address the issue. Therefore, the report is emphasising the need for a National Public Policy against food waste to be rolled out in France. Although, not all thirty-six measures will be rolled out at first, six of the measures have reached the policy making stages and this report has drawn significant worldwide attention to the need of stricter measures on food waste policy. Overall this proposal

has provided policy makers with a new set of ideas to change up existing efforts and to develop new actions which could essentially make France an international model for food waste prevention and recycling.

In the United Kingdom, the Love Food Hate Waste campaign which is managed by WRAP and funded with the help of the Government aims at helping to reduce food, raise awareness in partnership with the retailers, manufacturers, local governments and communities. New research from WRAP has shown that twenty-one percent of unavoidable household food waste has been cut since 2007, saving UK customers almost £13 billion over a five-year period. The German Government has also set up an information portal which offers consumers information about shopping, storage, and processing food. Likewise, in Denmark an initiative to stop wasting food has seen some good results with the Danish Trade and Agriculture. The Food Council reports that the Danes have seen a twenty-five percent reduction in food waste over the past seven years.

Although these initiatives mentioned above are often short lived and may even lack a long-term vision, their actual impact on reducing food waste remains unknown. With a few exceptions for example the UK WRAP programme regularly posts information on meeting their targets and sets up more long term goals for the future. To help see a reduction in waste the government needs to play a key role in combating food waste and take a step up to officially produce the statistics and figures and advocate campaigns. This should remind consumers of how to tackle their own personal food waste, and apply initiatives for the collection of data to know the extent of food waste in their country is causing. Due the absence of reliable data and historical benchmarks it will prove very difficult to evaluate the evolution of food waste generation. With several initiatives already set up to help collect the vital data needed, the aim is to improve the availability and quality of data.

Large retail chains such as Tesco have realised their need to combat food waste across their supply chain and stores. Tesco 2014 released figures on the huge amount of food wastage across their business and were the first major company to do so. In 2013/14 their food waste amounted to 56,580 tonnes while in 2014/15 they had reduced it to 55,400 tonnes (Tesco PLC 2015). Just looking at these figures alone highlights the huge food wastage across the globe

and this is only just one company. Tesco then decided it was time to introduce their reducing waste initiative as highlighted by WRAP. The average British household throws away on average £700 worth of food annually.

Food waste also incurs huge costs to businesses and with many people suffering from food poverty, it just highlights the need to start thinking about how to conserve food and throwing away perfectly edible food. Tesco's approach to reduce food waste is particularly interesting because they have devised several ways to tackle the problem. In store when an item sell by date is approaching they reduce it to clear minimising their surplus. Any unsold food is donated to charities across the UK and redistributed through FareShare. This charity takes donations of food that could not be sold in the supermarket that is still edible for human consumption and redistributes it to those who are suffering from food poverty. FareShare 2015, reported that food from the food industry had increased by 33% since 2014, leading them to increase the number of charities they are working with to 48% in only 12 months. By the end of 2014 FareShare estimated they were helping to feed 149,000 people per week and by doing so, were saving the food charities almost £20 million a year on food showing the reliance the charities are now having on FareShare.

5.3 Summary

In summary, this chapter looked at the Countries who have developed policies to tackle the food waste issue. The chapter looked at the FareShare initiative and WRAP in the United Kingdom which highlights some of their campaigns they use to encourage consumers to reduce food waste. WRAP regularly updates its data on its initiative but without government support and the lack of reliable data it remains to be seen how effective these campaigns can be. We saw how Tesco's approach to help feed families through their FareShare campaign has helped reduce their costs of food waste and help feed families stricken with poverty. By the end of 2014 FareShare reported to have fed 149,000 people on average per week from Tesco's donations. These initiatives could be very effective in helping reduce the amount of food not sold or with a short shelf life, from going to waste by helping those who cannot afford to buy food.

Chapter VI: Methodology

6.1 Introduction

The main aim of this chapter is to explore the steps involved in the research design process. The previous chapters outlined the relevant literature involved in this research. The purpose of this chapter is to provide information on how the research was conducted in order that it could be replicated by others if desired.

6.2 Research Objective and Question

The research objective represents a broad area of study. In this case, the objective was to better understand the area of food waste and people's attitudes and behaviours around food waste and their consumption habits. Specifically, the research had the following question to address:

- What are people's attitude and behaviours towards food consumption and waste in their own households and what can be done to help people better manage their waste?

6.3 Research Design

Bryman and Bell (2011) define a research design as a framework for the collection and analysis of data. A choice of research design reflects decisions about a priority being given to a range of dimensions in the research process. When designing a research project, it is important to be aware of the researcher's constraints and limitations, and it is important that the researcher considers these to design a piece of research that is effective to answer the question posed.

The research design depends on the research objectives and what is already known on the area. The research can be described as explanatory in nature as it seeks to establish casual relationships between variables i.e. the relationship between cross cultural differences, risk and mitigation (Raaij, 1978).

Research methods can be deductive or inductive. Deductive methods represent the commonest views of the nature of the relationship between theory and social research. The researcher draws

on what is known about a domain and on relevant theoretical ideas to deduce a hypothesis that must be subjected to empirical scrutiny (Bryman &Bell, 2015). Whereas, inductive methods are based on empirical evidence. Ghauri et al, (1995) summarise the difference between inductive and deductive methods by explaining that in induction, facts acquired through observation lead to theories while in deduction the hypotheses are already either accepted or rejected, thereby facilitating explanation or prediction. As the researcher was already very much aware of the importance of this area of study and some of the issues that are associated with the topic, therefore this is a deductive piece of research.

6.4 Quantitative versus Qualitative Research

Research can be undertaken using either quantitative or qualitative methods, or both together. Ghauri et al, (1995) suggests that quantitative research is broadly made up of the following factors compared to qualitative research:

- Quantitative research places its emphasis on testing and verification while qualitative research places emphasis on understanding.

- Quantitative research uses controlled measurements whereas qualitative research takes its observations and measurements from the respondents natural setting.

- Quantitative research does not entail the specification of a hypothesis and instead theory acts loosely as a set of concerns in relation to how the researcher collects data.

- Quantitative research tends to be results orientated and more concerned with analytical method whereas qualitative research is a process orientated looking at the area from a holistic viewpoint.

Quantitative research is rigorously designed and objective. Data collected from quantitative research aims to be generalized and reliable if it is gathered from a sufficient sample.

Quantitative methods consist of predetermined questions which will be in the form of surveys for this piece of research. Statistical analysis or interpretation will be conducted using statistical package for the social sciences (SPSS) software. Due to the data collection and data analysis being used in this research a quantitative approach alone has been adopted for this research piece.

6.5 Data Collection

Considering the research objective, along with the limitations, the use of primary data collection using quantitative surveys as the research method was decided. It was felt that this was the best method to answer the research question posed. Bryman and Bell 2015, describe this approach to research as a distinctive research strategy. It was described as entailing the collection of numerical data, a deductive view of the relationship between theory and research, and in this case relating to the behaviour between food consumption and waste.

Surveys are designed to provide statistical descriptions of people by asking questions (Fowler, 2013). Surveys are often characterised by a structured or systematic set of data known as a variable by case data grid. Information will be collected about the same variable or characteristics from at least two cases and essentially end up with a data grid (DeVaus, 2013). Fowler (2013) identified that the two main goals of a survey were to minimise the error of data collected in the surveys and to measure the error that necessarily is part of any survey.

The procedures used to conduct a survey have a major effect on the likelihood that the resulting data will describe accurately what they are intended to describe (Fowler, 2013). A survey brings together three different methodologies: sampling, designing questions and data collection. Each of these methodologies has different applications outside of the survey method but their combination is essential to good survey design (Fowler, 2013).

Using questions as measures is another essential part of the survey process. Initial surveys were not careful about the ways in which questions were worded. From this it was soon realised that how important it was for the interviewer to have a set of questions that provided the exact answers the researcher needed. Fowler (2013) described how necessary it was for designers

and users of survey research, that the total survey design approach means asking questions about all features, when attempting to evaluate the quality of a survey and the creditability of a data set.

The respondent groups were selected by suggestions brought to the researcher by the Stop food waste challenge initiative. Therefore, it must be noted that the sample of the population selected for this research is based on a non-probability approach, meaning that the sample was not randomly selected (Bryman and Bell, 2007).

6.6 Data analysis and presentation

The data collected was quantitative in nature and was expressed using graphs and a synopsis of the findings in each question. The data collected needed to be analysed to find a meaningful and symbolic content within. The data was classified into categories and analysis was conducted using conceptualisation to discover any important patterns and trends.

The analysis of the data was completed in the following ways:

Data Collection

- Organised and sent out 50 surveys between two groups
- Went through each questionnaire thoroughly to find any trends in the responses gathered.

Data reduction

- Data reduction is the process of examining, selecting, simplifying and abstracting the raw data (Bryman and Bell, 2015)
- The use of data reduction occurs continuously throughout the study, first a concise review of the relevant literature, followed by analysing the results of the surveys through SPSS.

Data Display

- Bar graphs are a useful tool in displaying the results from the survey to give a clear and concise review of the respondent's answers.

Drawing of conclusions

- Conclusions were drawn following the reflection of the data collected from the literature review and the analysis of data collected from the surveys

6.7 Limitations

There are limitations associated with this piece of research that should be considered when interpreting the results. One of the main limitations in this piece of research was time. The study was completed over a nine-month period whilst the researcher was working full time in a busy office environment. The small sample size and the use of quantitative research methods means that the generalisability of the findings is somewhat limited. Future research could be easily undertaken with a larger sample and if a suitable time frame allowed.

6.8 Summary

This chapter outlined the research approach adopted for the research along with detail on the methods chosen for data collection and analysis. This chapter serves to describe in detail the process undertaken for data collection as well as the deciding factors for the use of surveys as the chosen method.

Chapter VII: Results of Research

7.1 Introduction:

This chapter will focus on the results of the survey carried out and look at the response rate distributed. In addition, it will outline each question and the respondent's answers to each question. Each question and result is illustrated on a graph to outline the results in clear and concise manner.

7.2 Response Rate

The response rate for this questionnaire was 70% or 35 responses from 50. Given that the surveys were given out to two separate groups it yielded a good response rate even though the resources for this piece of research were quite limited. This is a satisfactory response rate. As already mentioned there are several steps which can be taken in an attempt to yield a higher response rate in terms of having more time availability and exploring other ways of getting surveys out to households.

7.3 Results

1. Question 1 was to establish the gender of the respondent of the person filling in the survey. There were 35 surveys distributed out those 35 2.9% were male and 97.1% were female.

2. Question 2 established the age groups the respondent belonged to. There were five different age groups that the respondents could choose from. These were as follows: 18-29, 30-39, 40-49, 50-64 and 65 and over. None of the respondents were in the age group of 18-29. The respondents of the age group 30-39 totaled 11.4% and the same percent applied to the age group of 40-49. The respondents in the age group 50-64 totaled 57.1% of the overall number of people surveyed. The respondents in the age group 65 and over totaled 20%. These figures showed that the most of the respondents to the survey were aged over 50.

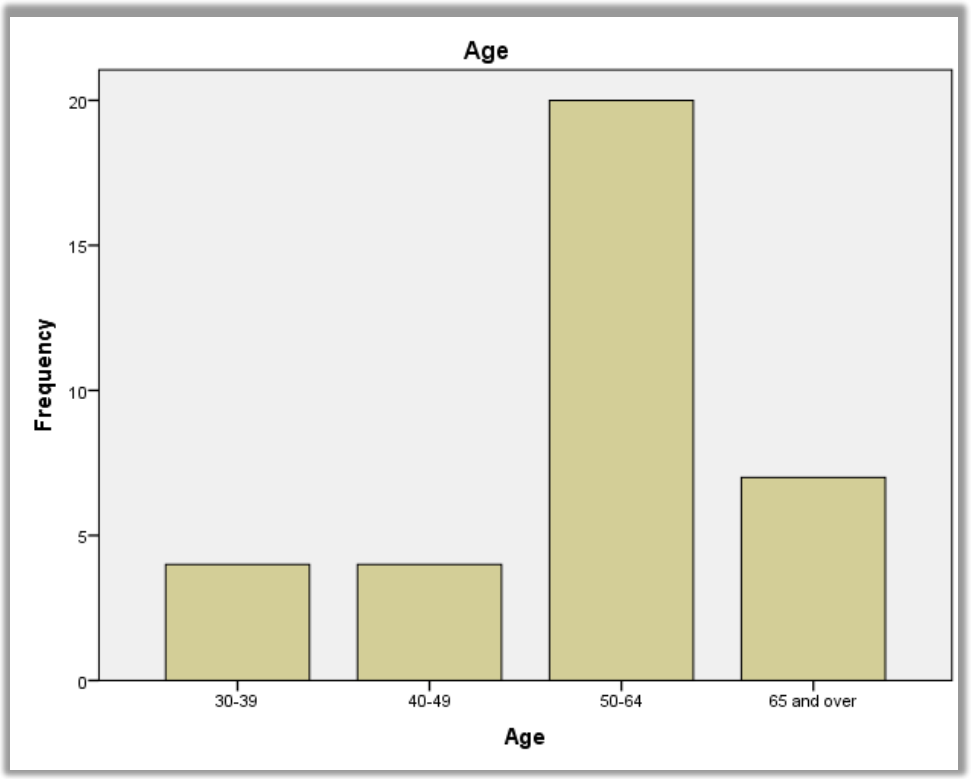


Figure 2: Age of respondents

3. **How many people are in your household?**

This question established the number of people that were in the respondent's household. The aim of this was to help figure out whether people who had a smaller household were more efficient in having less food waste than maybe those who lived in a larger household. The survey found that 11.4% of respondents lived in a one-person household. Most of the respondent to the survey at 48.6% lived in a two-person household. The smallest group in this question was 8.6% of the respondents were living in a three-person household. Finally, 31.4% of the respondents were living in a four-person household making this the second largest group.

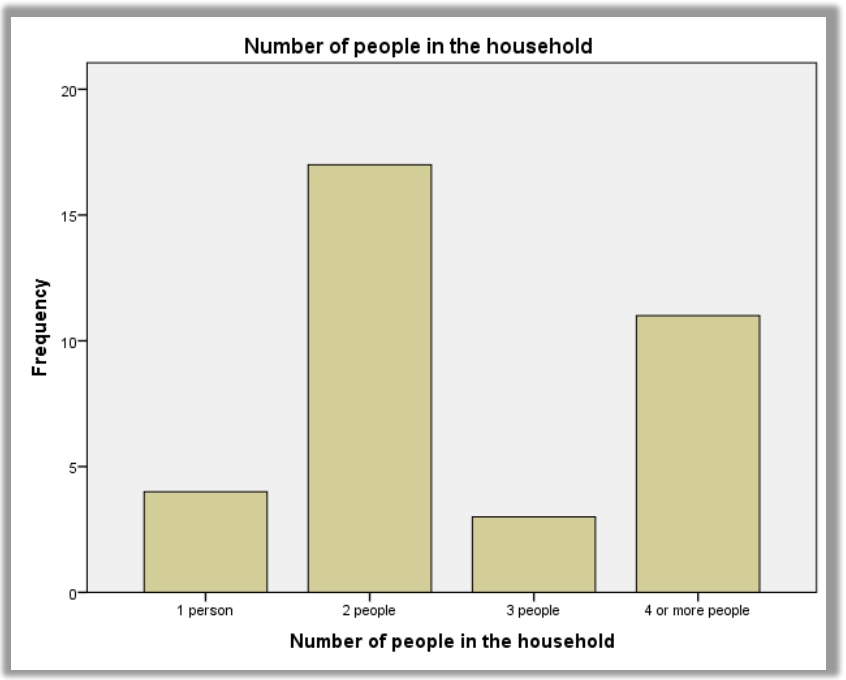


Figure 3: Number of people in the household

4. **How many children are in your household?**

This question aimed to find out if the number of children in the household had an influence on impulse buying and a higher output of waste from the household. The survey found that 57.1% of the households had no children. The next group of respondents which totaled 14.3% had one child in their household. 8.6% of the total respondents had two children in their household. 11.4% of respondents had three children in their household and finally 8.6% of the respondents had four or more children in their household.

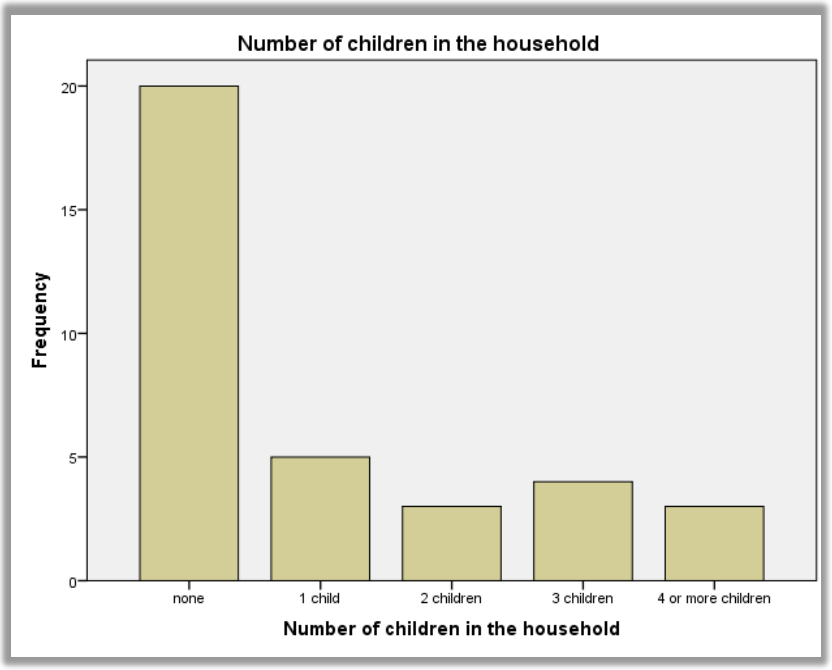


Figure 4: Number of children in the household.

5. **When do you make your main food shopping trips?**

It was discovered that 40% of those surveyed carried out their main shop once a week. 22.9% of those surveyed stated that they shopped twice a week. 17.1% of those surveyed stated that they shopped three times a week and finally 20% of those surveyed stated they shopped as required.

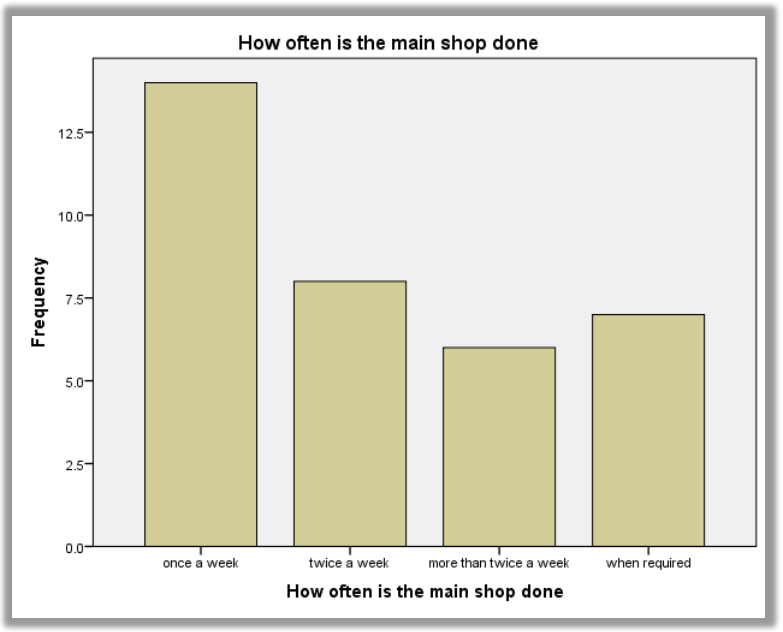


Figure 5: Frequency of the main shop

6. **How often do you shop for perishables?**

The results of the survey found that 28.6% of respondents shopped for perishable items once a week. While 31.4% of respondents shopped twice a week and 40% of respondents shopped for perishable food items as needed.

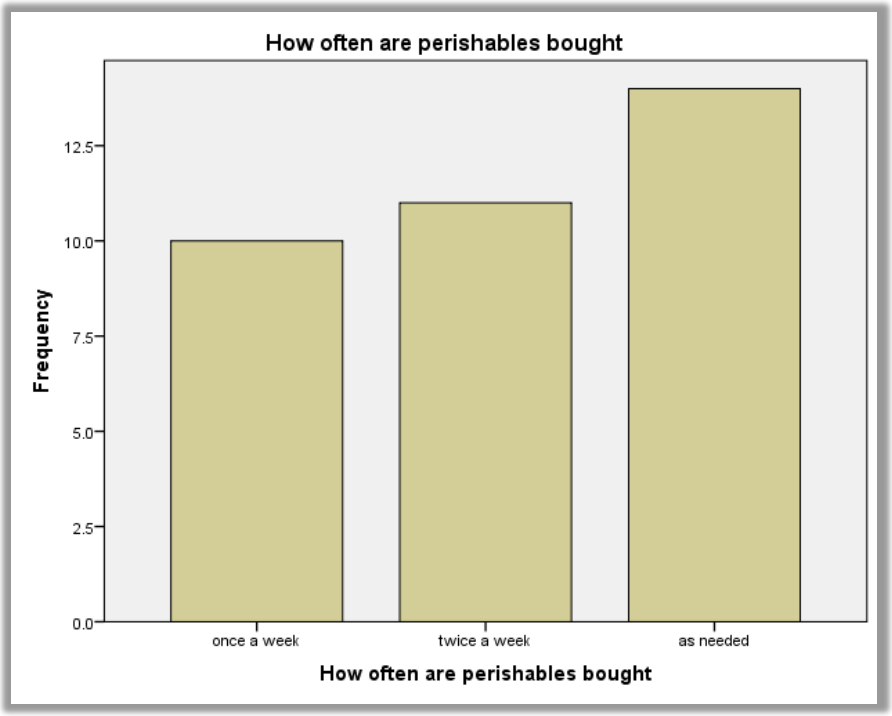


Figure 6: frequency of perishables bought

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7. **How often do you shop with a shopping list?**

The results found that only 11.4% of those surveyed always shopped with a shopping list. 8.6% of respondents rarely ever shopped with a shopping list and 17.1% sometimes shopped with a list. The survey found that 34.3% respondents most of the time used a shopping list whilst out shopping. Finally, 28.6% said that never used a shopping list to do their shop.



Figure 7: How often a shopping list is used

8. **How often do you buy things that are not on your shopping list?**

The survey found that 17.1% of the respondents rarely bought any items that were not on their lists. It was found that 45.7% of respondents sometimes tend to buy items not on their list. Whilst 20% of those surveyed often bought items not on their list and finally 17.1% regularly bought items on the list.



Figure 8: How often purchases are made without a shopping list

9. **Do you tend to buy food products at offers like multipacks and buy one get one free?**

The survey found that 42.9% of those surveyed were very likely to buy those items that were on special offer, 22.9% of those surveyed responded saying they would never buy items of special offer and 34.3% of respondents responded by saying that they sometimes would buy special offer items.

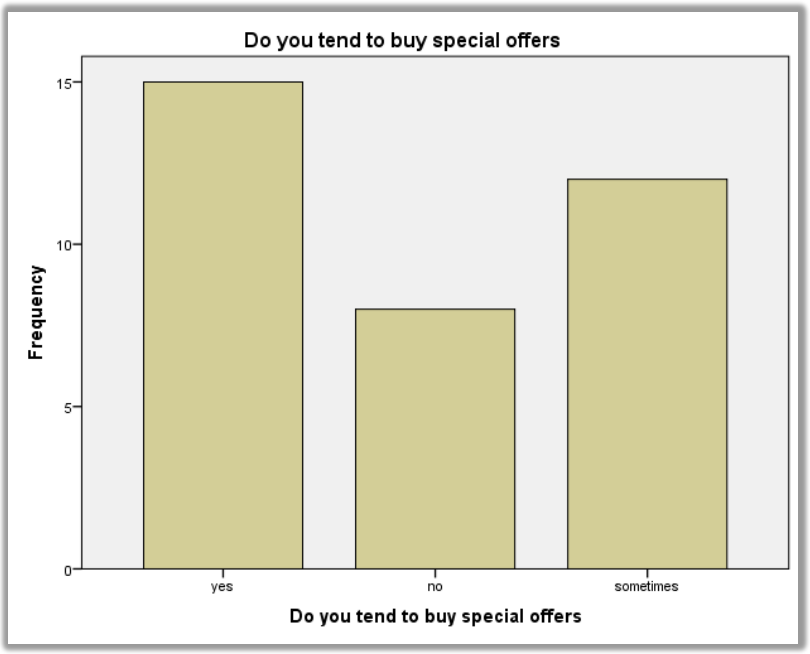


Figure 9: Tendency to buy special offers

10. Do you use the second product or do you tend to throw it out?

If the product was not used, were they likely to dispose of that extra item as it would have gone passed its sell by date or the pack would have been too big to use. 54.3% of respondents said they would use the special offer item. Only 8.6% of respondents said they would not use the second product. 20% of respondent said they would sometimes use the special offer product and 17.1% said they didn't know if they would use the special offer product or not.



Figure 10: Usage of special offer product

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11. When shopping with kids do you let, them put extra food items in the trolley?

The results from the survey found that 14.3% responded that they would leave the children whilst shopping put items as they desired in the shopping trolley. 28.6% responded that they would not leave children put any items in the shopping trolley. 11.4% responded that they would sometimes leave children put items in the shopping trolley. 45.7% of respondents, this question was not applicable to them.

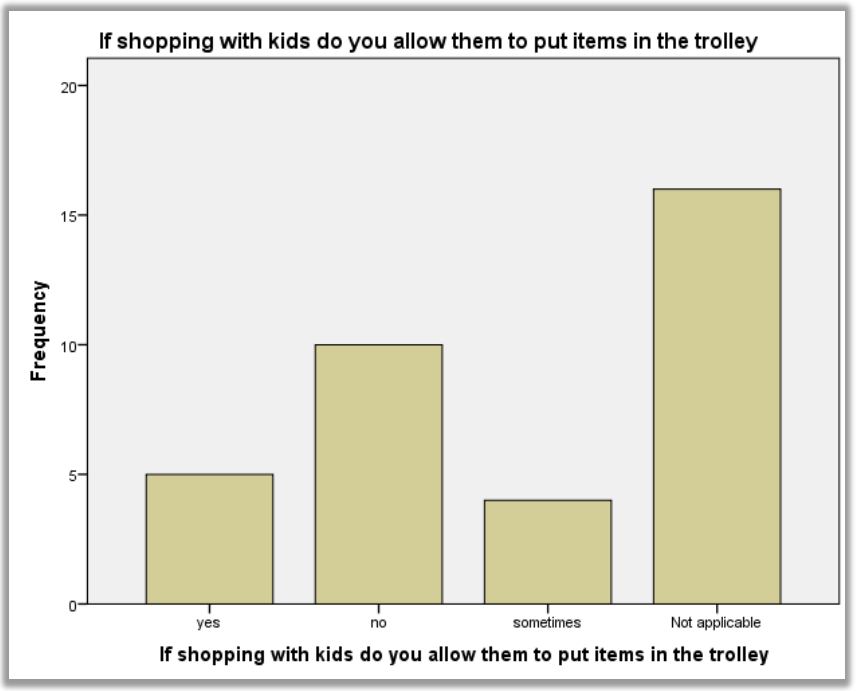


Figure 11: Shopping with children

12. How would you define a use by date?

The survey found that 48.6% responded that they understood that a use by date was a deadline to when a product should be consumed by. 37.1% responded that they understood that a use by date was a guideline by when the product should be consumed by. 11.4% of respondents understood that it was a guideline for supermarkets. 2.9% of respondents did not know what the use by date was for.

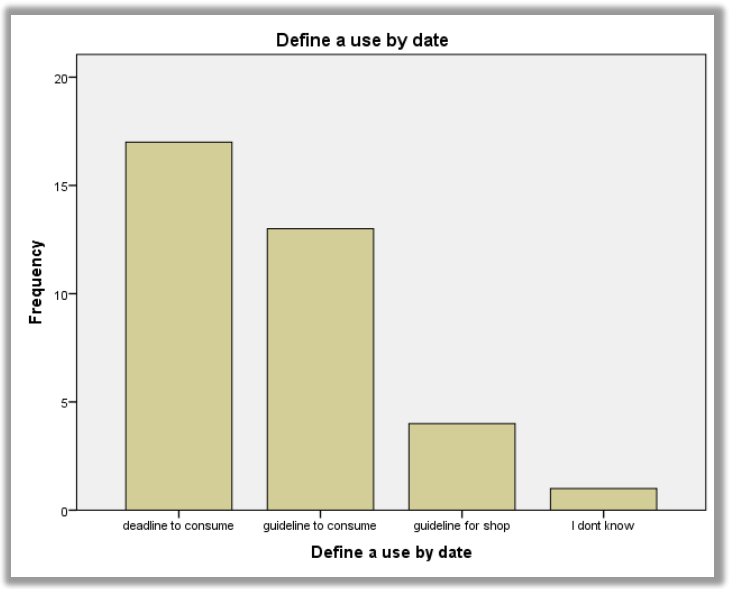


Figure 14: Defining a use by date

13. How would you define a best before date?

25.7% responded that they understood that a best before date was a deadline to consume a product by. 48.6% responded that they understood the best before date to be a guideline to when a product should be consumed by. 22.9% responded that they understood that it was a guideline for the supermarket. 2.9% responded that they did not know what a best before date meant.

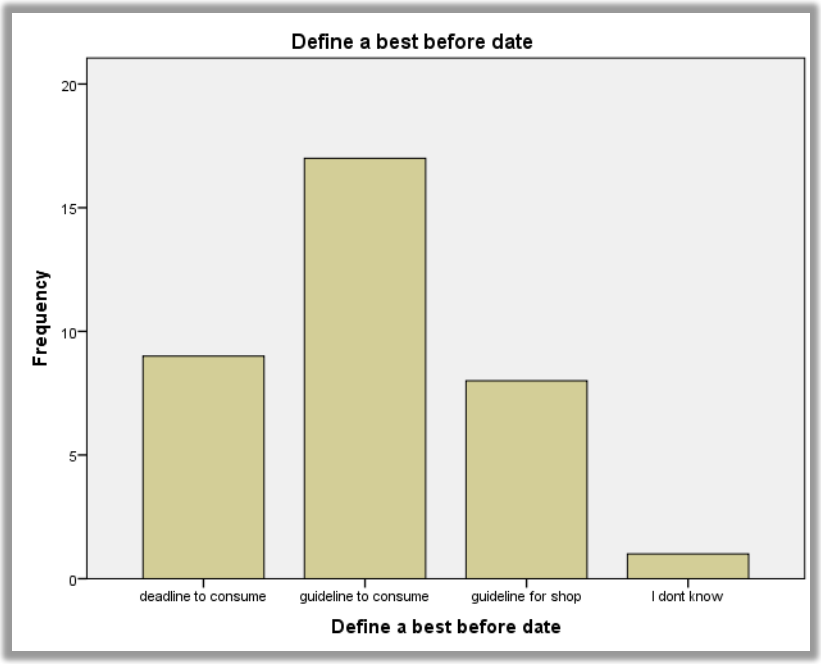


Figure 15: Defining a best before date

14. Do you find that you cook more than needed?

The survey found that 20% responded by saying they would cook more than they needed. 45.7% responded that they would not cook more than needed. 34.3% responded that they sometimes would cook more than needed.

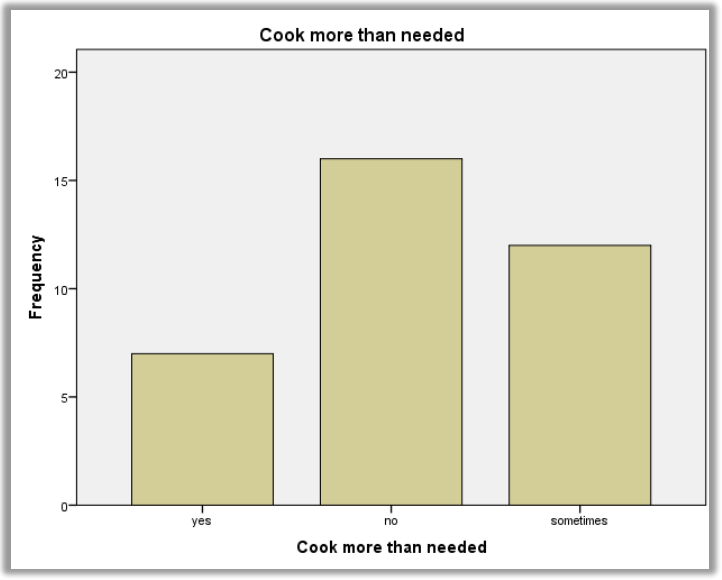


Figure 14: Cooking more than needed

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15. When cooking, do you measure how much food you use?

The survey found that 34.3% responded that they always measured their food. 31.4% responded that they would not measure their food. 31.4% would sometimes measure their food and 2.9% responded by saying they did not know.



Figure 15: Measuring food respondents used

16. Do you find you have leftovers after most meals?

The results showed that 8.6% responded by saying they would have leftovers after meal time. It was found that 45.7% responded that they would not have leftovers after meals and 45.7% responded that they would sometimes have leftovers after meals.

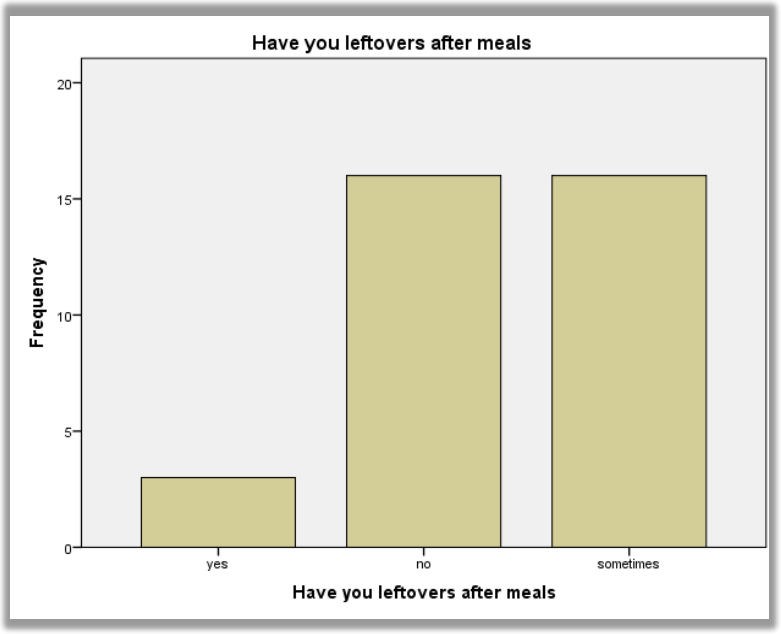


Figure 16: Leftovers after meals

17. Where do you find most of your leftovers are?

The survey showed that 37.1% of respondents said that most of their leftovers were on the dinner plates. A further 8.6% responded that most of their leftovers were in the serving bowls. Whilst most, 54.3 % responded that most of their leftovers were found in their cooking pots.

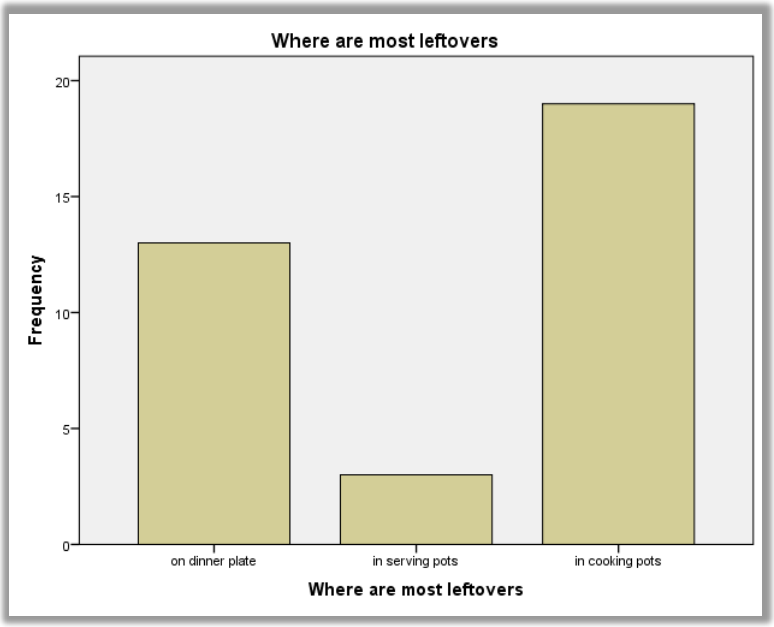


Figure 17: Where most of the leftovers were found

18. Do you tend to use these leftovers again?

The survey showed that 54.3% responded saying they would use their leftovers. Whilst 28.6% responded saying they would not use any of their leftovers. A further 17.1% responded that they would only sometimes use their leftovers.

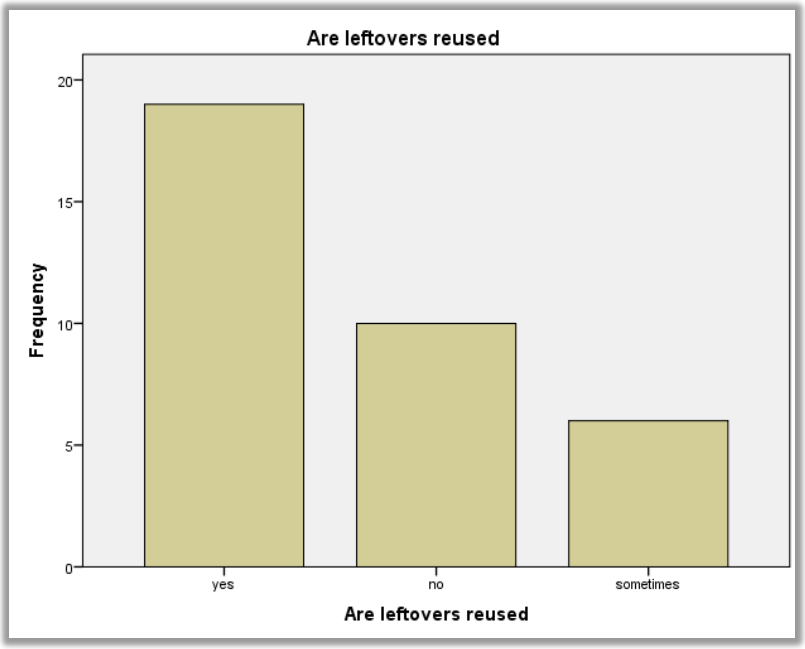


Figure 18: Are leftovers reused

19. What types of food do you throw away?

The question was divided into the different food categories to gather more accurate results. It was found that only 2.9% responded that the main food group they disposed of regularly was meat and fish. Then, 48.6% responded that they would dispose of fruit, vegetables and salad the most frequently. A further 2.9% responded that they disposed of pasta and rice frequently. Whilst 37.1% responded that they would dispose of bread and bakery the most. Finally, 8.6% responded that they would dispose of spreads and sauce the most.

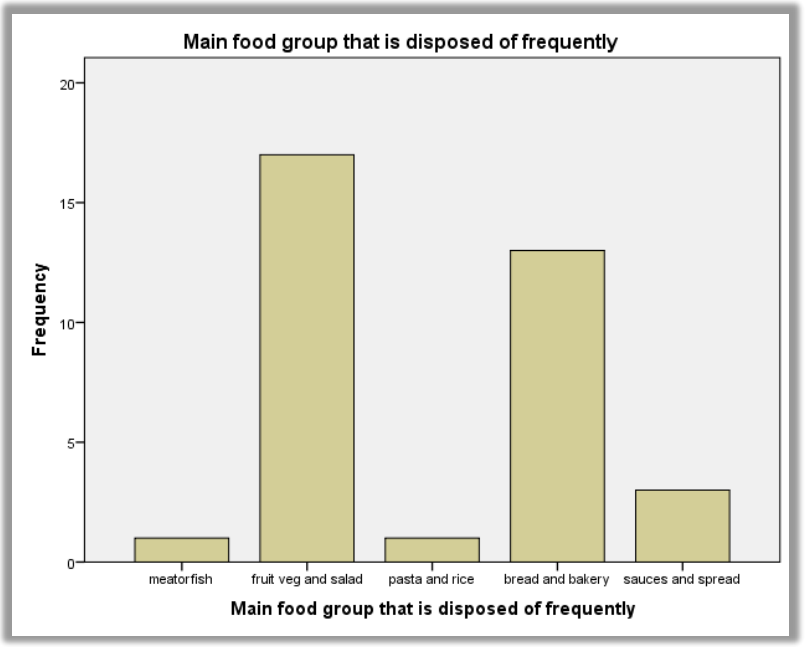


Figure 19: Main food groups disposed of

20. How do you dispose of your food waste?

The survey found that 37.1% responded that they mainly disposed of their food waste in the general waste bin provided by bin waste collection. Whilst, 14.3% responded that they disposed of their food into a compost bin. A further 48.6% responded that they mainly gave their food waste to animals, the main ones being birds and pets.

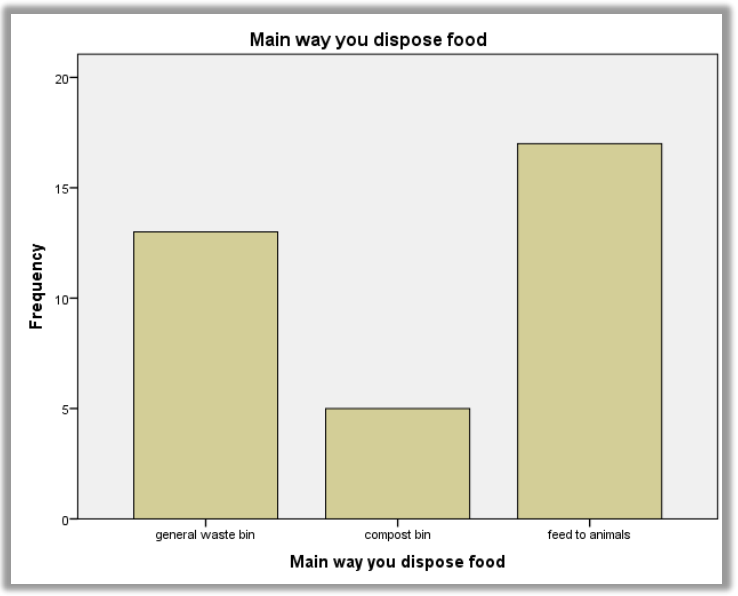


Figure 20: Main way food waste is disposed

21. Why do you feel you waste food?

The survey found that 25.7% responded by saying they cooked too much of the food product. Most of the respondents, 51.4% responded that their main reason for food waste was that the food had gone off. 11.4% responded that the remainder of the food cooked that they no longer desired to eat. 2.9% responded they didn't have enough time to cook the food. 2.9% responded that they stored the food item incorrectly. 5.7% responded that they did not know what the main reason for food waste in their household was.

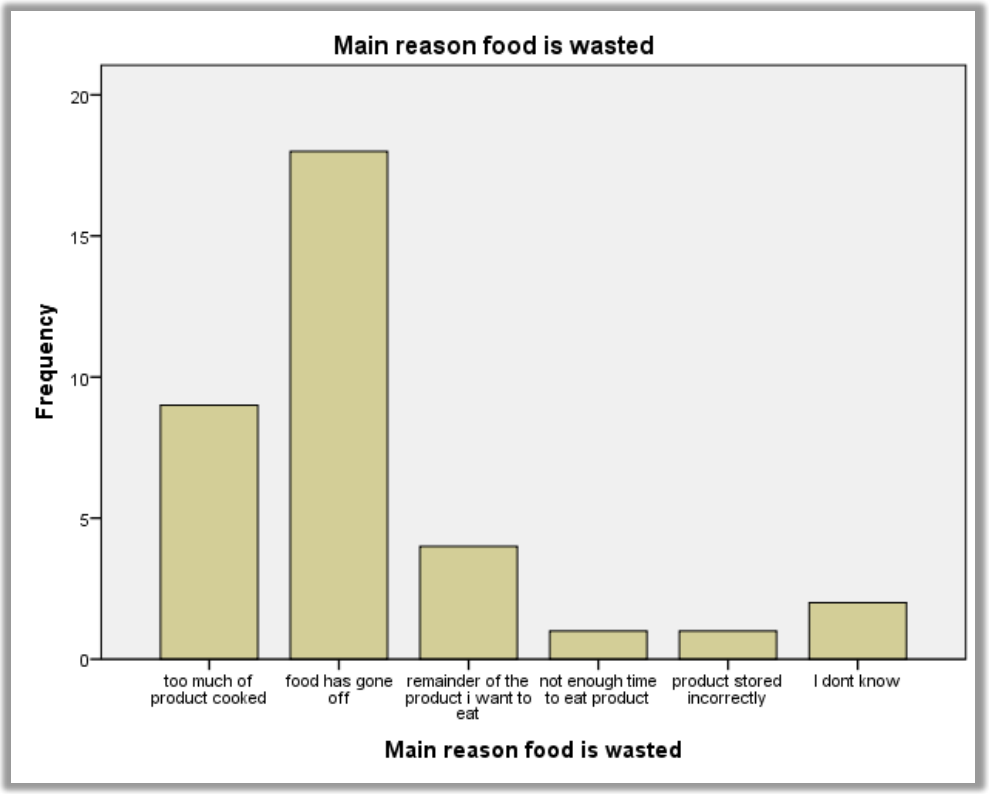


Figure 21: The main reason food is wasted

22. How much of the food you eat per meal do you think is wasted?

Most of the respondents, 62.9% responded that 15% or less food was wasted per meal in their household. 2.9% responded that 16% - 30% of food was wasted in their household per meal. 2.9% responded that 31% - 50% of food was wasted in their household per meal. 25.7% responded that none of their food was wasted after any meal. 2.9% responded that they did not know how much food was wasted in their household.

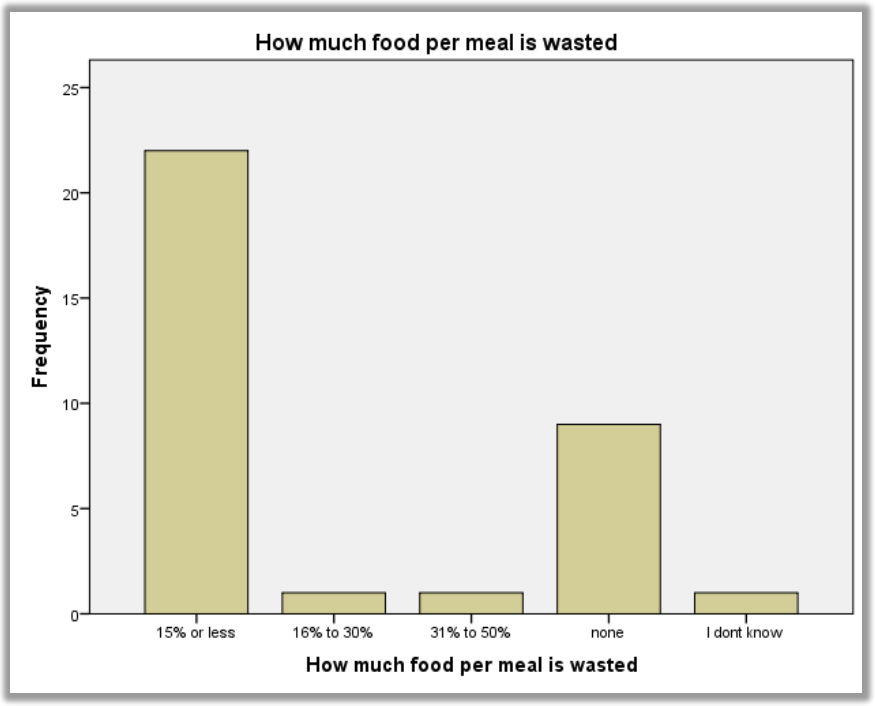


Figure 22: Percentage of food waste per meal

23. Which of the following do you think would help you reduce your food waste?

A list of options which provided a variety of different options was available on the survey. 17.1% responded that using the freezer would be a good option in helping to reduce their food waste. 28.6% responded by saying that if suppliers offer smaller packing or portion sizes, that this would be helpful for them. 14.3% responded that reusing leftovers would be a good option for them. 11.4% responded that better estimation of portion sizes would help them to reduce food waste. 25.7% responded that better shopping and planning by them would help them to reduce food waste. 2.9% responded they did not know.

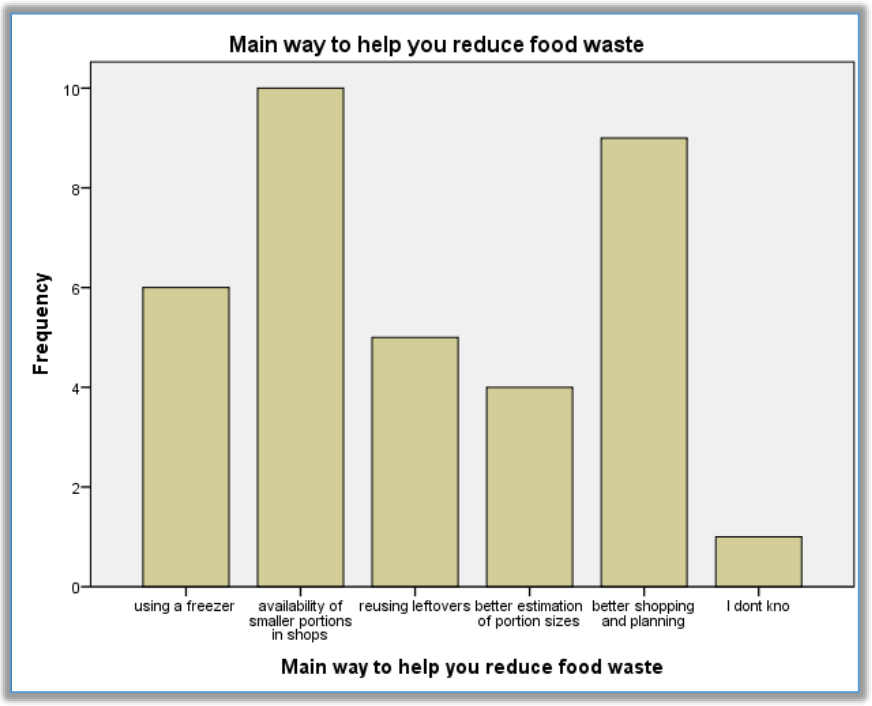


Figure 23: Options that would help in reducing food waste

24. What would convince you to better separate and manage your food waste?

This question was put in at the end to establish from consumers what would encourage them to be more mindful with their waste disposal. 22.9% responded that if they were reassured from waste disposal companies, the waste was being managed effectively. 31.4% responded that they would like to see more and better waste recycling facilities in their area. 11.4% responded that if the government offered more financial incentives in the way of tax or refunds that it would encourage them more to separate their waste. 8.6% responded suggesting more convenient ways for waste collection from their home. 14.3% responded saying they would like more information on how and where to separate waste more effectively. 8.6% responded saying they did not know what would convince them to better manage their waste.

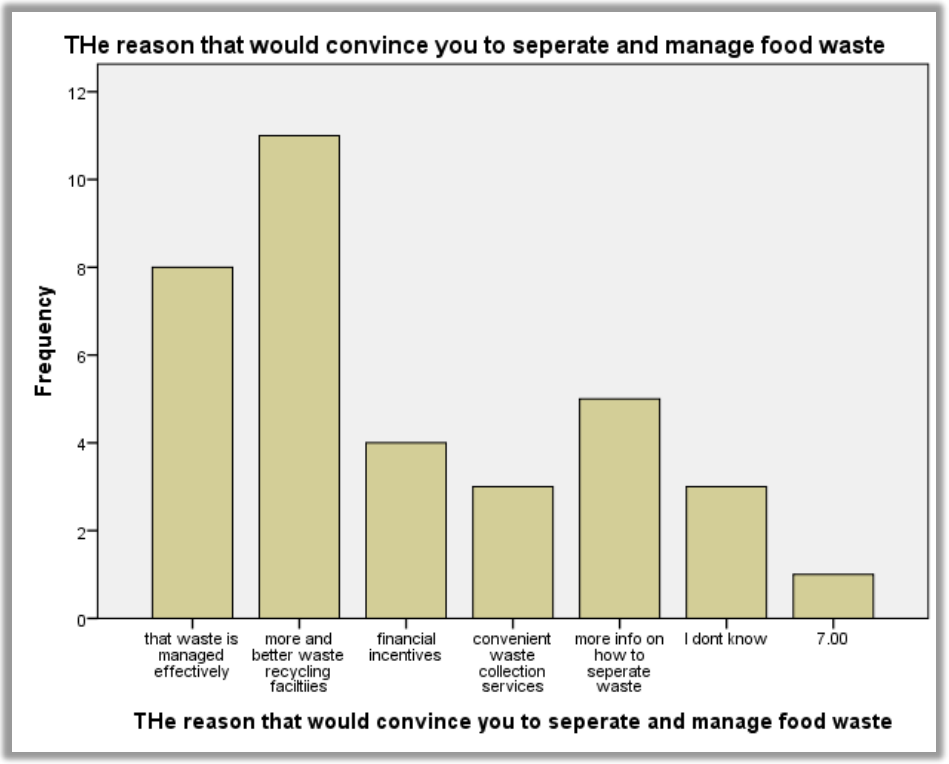


Figure 24: Reasons to help you separate and manage food waste

7.4 Analysis of results

The respondents to the survey were predominately female which mainly fell into the over 50 age category. Most of the respondents lived in a two-person household and many of the respondents had no children in their households. The aim of the question was to establish whether living in a smaller household would bare influence on whether people would be more conscious of what food they wasted and how much food they purchased. Also, if there were children in the household would there be more food bought and thrown out because of over purchasing? The survey found that most of the respondents had no children in their households. Those who did have children in their household were asked would they leave children put items in the trolley leading to 28.6% responding that they would not. The question was unable to find a link between over purchasing whilst shopping with children as most of the respondents did not have children.

The next set of questions were used to establish a better understanding of the households shopping habits and how often the main shop was done. It was found that 40 percent of the respondents did their shopping once a week. Often people would have to buy perishable food items more frequently as these items would be most likely to go stale or be used up the quickest. When asked, the respondents reported that 40 percent would shop for these items as needed outside of the main shop.

The next question asked was to find out from respondents if they shopped with or without a shopping list. The purpose of this question was to find if people were more likely to always shop with a list and stick to it whilst out shopping or were they likely to shop and buy what they thought they needed in the household. The results of this question were varied in response as only 11.4 percent always shopped with a list. A further 34.3 percent responded that most of the time used a shopping list whilst out shopping and 28.6 percent said that never used a shopping list to do their shop.

It was found from the survey that the respondents were likely to buy items on special offer thus showing that consumers are persuaded by items that are better value for money and most would use the special offer item. Respondents of the survey said they that would be aware of use by

dates on products meaning that consumers are aware of dates and would be influenced by whether to use a product. The survey was used to find if people understood the meaning of a use by date and a best before date. The Food Safety Authority Ireland 2017 illustrates the date of minimum durability, or 'best before' date, is the date until which a foodstuff retains its specific properties e.g. taste, aroma, appearance, any specific qualities which relate to the product, vitamin content etc. This is only relevant when the product has been stored appropriately and the package unopened. Typically, a 'best before' date is used for food products such as canned, dried, ambient, frozen foods etc.

Many foods that are past their 'best before' date may be safe to eat. In the case of foods, which from a microbiological point of view, are highly perishable and are therefore likely after a short period to constitute an immediate danger to human health, the date of minimum durability must be replaced by the 'use by' date. The 'use by' is the date up until which a food may be used safely i.e. consumed, cooked or processed, once it has been stored correctly. After the 'use by' date, a food is deemed unsafe in accordance with article 14(2) of Regulation EC No. 178/2002 and cannot be sold. It was found in the survey that 48.6% responded that they understood the best before date to be a guideline to when a product should be consumed by and 48.6% responded that they understood the best before date to be a guideline to when a product should be consumed by. This showed that consumers understood that both the use by date and best before date meant the same thing. It could be seen that many consumers are confused by what dates mean on food packaging thus showing a lack of knowledge and understanding in this area.

It was found in the survey that most of the respondents were unlikely to cook more than needed and would mostly not have much leftovers after meals. People of the survey were likely to use up leftovers the following day if they had any. This showed that the respondents understood trying to reduce waste in their household. It was found that the main foods disposed of from the respondent's households were fruit, vegetables and bread. These items tend to be over purchased and are most likely to go beyond their use by date the quickest. The next question illustrated that the main reason they disposed of the food was because the food had gone off. This is useful to know as people could become more aware of the food most often disposed of and they could buy less reducing their waste.

The survey looked at how people were disposing of their food waste. It was found from; that most of the respondents got rid of their food waste by feeding it to their pets or other wildlife. Whilst most of the other respondents were disposing of their food waste through means of the separate food waste bin provided by their bin collection service. When asked; what would encourage respondents to better manage and separate their waste, the responses were quite mixed. The top three answers that were given were if they were being reassured from waste disposal companies the waste was being managed effectively, the next response was they would like to see more and better waste recycling facilities in their area and finally they responded by saying they would like more information on how and where to separate waste more effectively. From these three responses, it could be seen that there is a lack of understanding from consumers about food waste and how it should be managed and separated effectively. It could be taken that bin collection services may need to provide clearer and more informative literature for their customers on the issue of separating the different types of waste from households.

7.5 Summary

In summary, this chapter detailed the results of the surveys, and outlined the responses to each question graphically, along with a detailed account for each question. The chapter then went into a more detailed analysis of the results and found some interesting areas that could be used for future research. The analysis showed that respondents were likely to buy more items on special offer. This demonstrates the power of marketing and promotion campaigns in grabbing consumer's attention. It was also found that respondents did not understand best before and use by dates which means that consumers could find labelling confusing and this depicts an area of interest for further research. Interestingly, it was found that the respondents were more likely to feed their food waste to pets or other wildlife. Finally, respondents would like to be reassured by their bin collection provider that their waste was managed effectively and seek clearer and more concise information on how to separate their waste better.

Chapter VIII: Conclusion and Recommendations

8.1 Conclusion

As a result of reviewing all the available literature on this subject, a hypothesis for this research was formed. The hypothesis was that people are unaware of the levels of food waste they generate from their household through over purchasing of food and eventually discarding the food because it has gone passed its used by date. The focus of this research was to find out what were people's weekly shopping behaviours, their cooking habits and how they are disposing of their food waste.

A review of the literature on food waste highlights that by 2050, food production will need to increase by 60 percent to meet growing demands from consumers. This is mainly due to the predicted growth in the global population and the rise in demand from consumers (FAO, 2013) Food production companies will need to make better use of the food ingredients already available. According to, Bagherzadeh et al, 2014 there is a great opportunity for edible food that is usually wasted to be redistributed to the food insecure populations. Many factors equate to why food waste needs to be reduced and the various types of food waste and losses within the food supply chain. The FAO 2013 figures show just how much food waste is costing and the effects it is having on our global system.

The environment impact food waste is having on our globe was discussed in more detail. The FAO have carried out research and found some interesting information on the impact food waste is having across our environment. They found that soil degradation is happening at the agricultural stage of food production and Blum 2013, went on further to say that most of this soil degradation is happening in poorer countries leading to food insecurities.

The literature looked at the drivers which could be leading to the high levels of food waste we are seeing. Rozin 2005, identified that food has become more affordable and accessible to consumers in the developed world. In relation to the survey, one of questions the researcher asked was proportional to consumers likely to be persuaded by special offer promotions in the supermarket. The survey found that most of the respondents would buy special offer items

which relates to the theory of Story and French 2004. This illustrated consumer do tend to over purchase food due to the special offers that attract them to buying more than they would need.

The response rate for this survey was 70 percent. For future research on this topic it would be advised to use other forms of data collection to get a more In Depth analysis. Interviews which could be carried out on people working in the food production industry, focus groups, and distributing more surveys to the public. This would allow for a greater amount of information to be gathered and enable researchers to develop the points which are made through this research.

The results of the survey were interesting and the researcher could pick up on a few points of interest which included, that consumers were likely to buy items on special offers showing that marketing techniques work for consumers to purchase more items and at a lower cost to them. Interestingly, when asked about use by dates and best before dates, consumers were unsure of the meaning of these dates and this could possibly be causing consumers to discard perfectly good quality food. So, it could be said that consumers need clearer information on what these dates mean and possibly for production companies to provide clearer labelling on their products.

The survey also examined how people were disposing of their waste. It was found that most of the respondents were disposing of their food waste to pets and the rest was discarded through the general waste bin. To get a more concise answer on this question an option for respondents to choose a separate food waste should have been provided. The researcher could then interpret if separate waste bins were being provided by bin collection services to their customer base.

The survey asked respondents what ways would encourage them to better manage their food waste; they responded by saying if they were being reassured from waste disposal companies that their waste was being managed effectively. The researcher found that consumers would like more information on how and where to separate waste more efficiently. This indicates that consumers could be confused about how to manage their waste properly and they need clearer, more concise information on how to manage this more successfully going forward.

The results from the survey are interesting and can provide some useful recommendations with regards to clear labelling on food and better information on food waste.

8.2 Recommendations

The first recommendation of this research is to conduct more in depth research in managing and understanding food waste behavior among consumers. Since this was a minor research project with limited time and resources, there is scope to develop this topic in much more detail. It could be suggested that both quantitative and qualitative methodologies be used to gather a much more in depth analysis in the area. This could take form in distributing more surveys, conducting interviews with people working in industry and focus groups.

The second recommendation would be to look at how to provide better information on food labeling to consumers. This will enable consumers to understand dates on food products and quite possibly, see a reduction in their food waste by making more informed choices when purchasing food or when deciding whether they should eat it or discard it.

Thirdly, the researcher recommends that Ireland as a country should look at more ways to tackle food waste by setting up initiatives like in the United Kingdom where the WRAP and FoodShare schemes operate. These schemes take food nearer its best before date to be redistributed to people who are unable to afford to eat properly and regularly due to poverty. Although the Bia initiative is here in Ireland, there is very little known about it. Its only through the researchers own endeavor that this initiative was discovered to be in operation. The government would need to support more of these initiatives in the fight against food waste going forward in the future.

This research has generated some interesting and valuable points from consumers and their attitudes and behaviors around food consumption and their understanding of food waste.

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Appendices

Food Waste Attitudes and Behaviours Survey

I am a MSc student in UCC who is currently undertaking a research project as part of my course. My topic aims to gather information on people's behaviour and attitudes towards food waste and consumption. Please know that your participation in this survey is not mandatory but by completing it the information you supply will be kept confidential and the results will be written up in my thesis and only seen by myself and my supervisor.

Background Info

1. Gender:

- o Male
- o Female

2. Age:

- o 18 – 29
- o 30 – 39
- o 40 – 49
- o 50 – 64
- o 65 and over

3. How many people are in your household?

- o 1 person
- o 2 people
- o 3 people
- o 4 or more people

4. Number of children in your household?

- o None
- o 1 child

- o 2 children
- o 3 children
- o 4 or more children

Chapter One: Shopping

5. When do you make your main food shopping trips?

- o Once a week
- o Twice a week
- o More than twice a week
- o When it is needed

6. How often do you shop for perishables (e.g. Fruit, Veg, Bread, and Meat)?

- o Once a week
- o Twice a week
- o As needed
- o I don’t know

7. How often do you shop with a shopping list?

- o Always
- o Most of the time
- o Sometimes
- o Rarely
- o Never

8. How often do you buy things that are not on your list?

- o Never
- o Rarely
- o Sometimes
- o Often

o Always

9. Do you tend to buy food products at offers like multipacks and buy-one-get-one-free?

o Yes

o No

o Sometimes

o I don’t know

10. If so, do you use the second product or do you tend to throw it out?

o Yes

o No

o Sometimes

o I don’t know

11. If shopping with kids do you let them put extra food items in the trolley?

o Yes

o No

o Sometimes

o I don’t know

12. How would you define a ‘Use-by-Date’?

o It is a deadline for when to consume the product by

o It is a guideline for when to consume the product by

o It is a guideline for the shop to know how long to display the product for

o I don’t know

13. How would you define a ‘Best-before-Date’?

o It is a deadline for when to consume the product by

o It is a guideline for when to consume the product by

o It is a guideline for the shop to know how long to display the product for

o I don’t know

Chapter Two: Cooking

14. Do you find you cook more than you need?

o Yes

o No

o Sometimes

o I don’t know

15. If you are cooking do you measure how much food you use?

o Yes

o No

o Sometimes

o I don’t know

Chapter Three: Serving and Leftovers

16. Do you find you have leftovers after most meals?

o Yes

o No

o Sometimes

17. Where do find most of your leftovers are?

o On the dinner plate

o In the serving pots

o In the cooking pots

18. Do you tend to use these leftovers again?

- o Yes
- o No
- o Sometimes
- o I don’t know

19. What types of food do you throw away?

- o Meat or fish
- o Fruit, veg, and salads
- o Drinks (including milk)
- o Dairy and eggs
- o Pasta and rice
- o Bread and bakery
- o Sauces and spreads

20. How do you dispose of your food waste?

- o General waste bin
- o Compost bin
- o Feed to animals

21. Why do you feel you waste food?

- o The supplier puts too much food in the product it supplies.
- o Too much of the product cooked / prepared
- o Food has gone off
- o Remainder of the product that I no longer use or want to eat
- o Not enough time to eat the product
- o Product stored incorrectly
- o I don’t know

22. How much of the food you eat per meal do you think is wasted?

- o 15% or less

- o 16 to 30%
- o 31 to 50%
- o More than 50%
- o None

23. Which of the following do you think would help you to reduce your food waste?

- o Using a freezer to conserve food
- o Availability of smaller portions in shops
- o Reusing the leftovers you create
- o Better estimation of portion size to reduce food waste
- o Better and clearer labelling of food products, and information on storage and preparation
- o Better shopping and planning by your household
- o Better and clearer information on how to interpret best before data
- o I don't know

24. What would most convince you to better separate and manage your food waste?

- o Reassurance that the waste is being managed effectively
- o More and better waste recycling facilities in your area
- o Financial incentives (e.g. taxes, refunds) to separate waste
- o More convenient waste collection services at your home
- o More information on how and where to separate waste
- o I don't know

I would like to take the opportunity to thank you for taking part in this survey your participation is greatly appreciated.