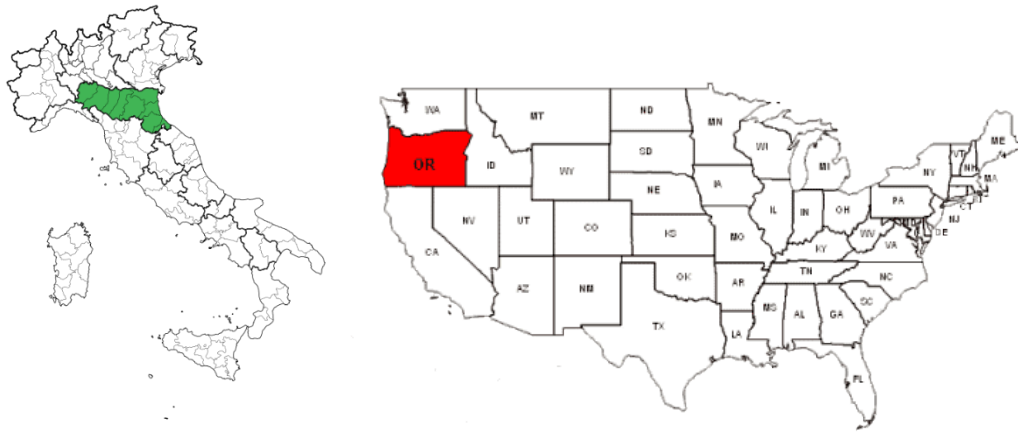


**Carnism ideology in food waste management:  
A qualitative comparison among stakeholders in the US state of Oregon,  
and the Italian Region of Emilia Romagna**



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## Abstract

People in the US and Europe eat the most meat worldwide, lose or waste about 20% of this product overall, and they waste the most food per capita. Food waste is currently addressed as an issue of volume, so programs and policies target foods that are wasted more by weight rather than foods that are more impactful when wasted in terms of greenhouse gas emissions, like meat. The US and Europe will be contributing more to climate change by volume of wasted food they produce if they continue to manage wasted food this way. This study sought to discover why meat waste is not a priority in the policy making process for food waste, how that may vary by culture, and if stakeholders intend to support policies that target more impactful food. The comparative analysis of Oregon and Emilia-Romagna using qualitative methodologies, employed semi-structured interviews with policy makers, public administrators and experts involved in food waste policies and programs. A content analysis of recent laws in each region were used to support data from the interviews and policy recommendations. The belief system, carnism, was used to explore cognitive biases in decision making about management of wasted food. Overall, there was little variation in the findings among the two cultures. Linking food waste, upstream impacts and emissions was presented as a shift in conceptualizing food waste in recent years. These stakeholders identify food waste as problematic both for social and environmental reasons. Stakeholders' intentions to support the idea of targeting meat waste was not influenced by their carnist ideology, but the value placed on meat and its cultural importance in both regions may inhibit actions in the future. Stakeholders in both regions should use evidence-based messaging to incentivize and inform consumers about meat waste as well as acknowledge and address their own biases toward meat foods.

**Keywords:** climate change, food waste, meat waste, carnism, cognitive bias, qualitative comparative analysis

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## Introduction: GHG Emissions, Waste, and Meat

“If every American eliminated just a quarter-pound serving of beef per week, the reduction in greenhouse gas emissions would be equivalent to taking four million to six million cars off the road,” says the Castleberry of the Natural Resources Defense Council of the United States (2015). Greenhouse gasses (GHGs) are gasses that trap heat in the atmosphere such as; CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, and others including hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride (US EPA, 2017) which cause climate change. People in the United States have huge carbon footprints, but the scope of the issue of emissions increases exponentially at the global scale. This issue reaches far beyond a person’s behaviors about food, but this topic deserves to be examined.

This introduction walks through technological data and insights into the agricultural policy environment to describe the problem mainly at global and national levels, with the goal of describing who has the responsibility and opportunity to take control of these emissions as well as how and where emissions occur. Problematic countries like the United States and other industrialized nations such as Italy have to take control of their emissions in this area, and reverse course to try and avoid the disastrous effects of climate change.

The next few pages highlight subsets of emissions that come from agriculture, forestry and land use to set the stage for how this study contributes to understanding the larger issue. Generally, emissions from meat foods are exponentially higher than plant foods. Because of this, wasting meat is more problematic than wasting other food. Since people in industrialized and wealthy nations eat more meat, they have the opportunity to reduce their emissions in this sector more than other countries. Regional variance in consumption of meat and food waste behaviors needs to be considered. For this research, a region of northern central Italy, Emilia Romagna and a state in the northwestern US, Oregon were selected as cases for comparison of food waste policy.

Drawing on the social psychological theory of carnism, this study explores one aspect of this immense problem, which requires a multitude of solutions both technological and social in nature. Implicit biases that privilege and protect the consumption of meat may impact policies and programs aimed at food waste and specifically meat waste. To more formally state the research questions, first, this study sought to discover why meat waste can be overlooked, dismissed, or downgraded in importance in the policy making process for policies or solutions surrounding food waste and how that may vary by culture. The second question was whether stakeholders support food waste policies aimed at addressing food that has more environmental impacts. Two main hypotheses were proposed. If food waste is a problem for the environment, then meat waste should have a stronger focus. Also, the belief system called carnism could impact decision making in a variety of ways both intentionally or unintentionally.

## GHG and Diet

The Food and Agriculture Organization (FAO) of the United Nations has found that about 75% of the agriculture, forestry and other land use (AFOLU) GHG emissions can be attributed to all livestock throughout the full life cycle of that food from inputs to the end of life of that product (2009). (See Figure 1). Eighteen percent of the total emissions globally belongs to livestock, which seems unexpectedly and impressively large in comparison to contributions of the transportation system which is 14%. Out of those livestock emissions, 99% are due to rearing activities such as land use change for pasture or crop growth for feeding, the animal's digestion, and waste management on the farm or field, while only 1% of emissions come from processing and transportation of the meat products (FAO, 2009).

A more recent comprehensive study published by the Worldwatch Institute critiques these findings. Goodland and Anhang assert that livestock and their byproducts account for much more (51%) of the annual worldwide human-related GHG emissions due to previous work leaving huge contributions

from animals misallocated or uncounted (2009). Despite varying conclusions on the contribution percentage of the GHG load in the atmosphere, it is clear that a closer investigation into ways to decrease animal agriculture output of these gasses is needed.

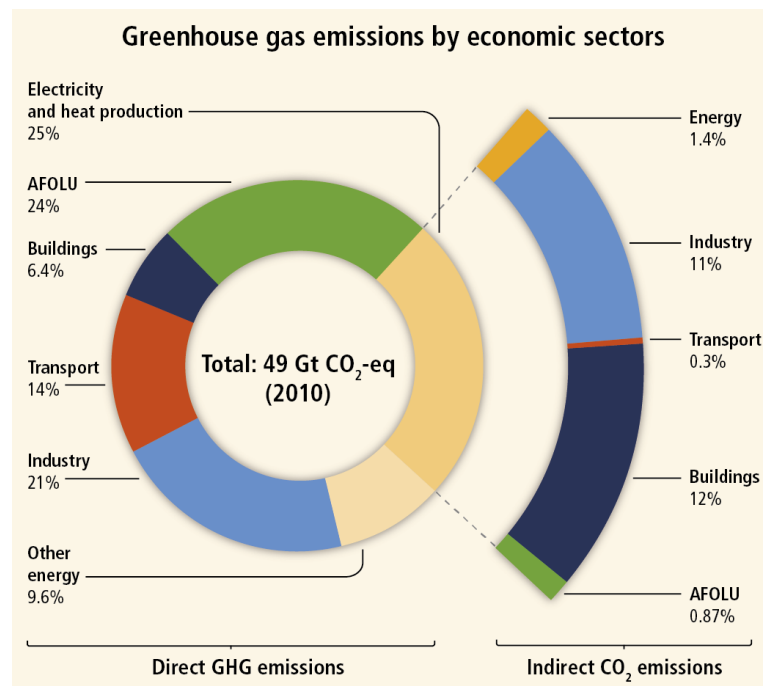


Figure 1. Greenhouse gas emissions by economic sectors (IPCC, 2014, p. 47)

The Oregon Global Warming Commission reported to the Oregon Legislature in 2017, that the agriculture sector contributed the least of all four of the sectors that they examine. In order of most to least emissions, transportation was the top emitter, then the residential and commercial sector, then industrial and finally agriculture (Oregon Global Warming Commission, 2017). They state, “Agricultural activities have consistently accounted for approximately 5 million MTCO<sub>2</sub>eq ... Slightly more than 2 million MTCO<sub>2</sub>eq is from methane [CH<sub>4</sub>] that results from enteric fermentation (i.e. digestion of feed from livestock),” (Ibid, p. 19). For Emilia Romagna, agriculture contributes about 723 thousand MTCO<sub>2</sub>eq (Ecoway, 2015; Regione Emilia-Romagna, 2017a).

While this is important to know for targeting change in Oregon (OR) and Emilia Romagna (ER), this does not account for the full embedded emissions of a globalized food system. Oregonians do not eat food that was only produced in Oregon and this most likely can be said of Emilia Romagna as well. The 5.2% or 7% of total emissions for agriculture of OR and ER respectively, would start to appear more like the contributions in Figure 1, once imports and exports of these foods are accounted for.

The latest report from the FAO in 2016, points out that numerous studies on the topic of environmental consequences of livestock focusing mainly on GHGs and land use with the life cycle analysis or assessment (LCA) methodology have concluded that, "...alternative diet scenarios with less animal-source food could contribute to reducing global GHG emissions, and have positive impacts on human health," (p. 86). Life cycle assessment or life cycle approach methodology is a type of analysis that looks at impacts of a product through cradle to grave. Predictions for the future are that livestock production and consumption will increase globally, not only because of increased world population but also a shift from plant source foods in the diet to animal source foods (FAO, 2016; McMichael, Powles, Butler & Uauy, 2007; Tilman & Clark, 2014).

In general, when certain diets are compared per calorie and per gram of protein produced, vegetarian diets can vastly reduce GHG emissions (See Figure 2) (Tilman & Clark, 2014; Ranganathan et al., 2016). Even diets that include processed plant proteins in the form of meat analogues which mimic the texture and look of meat, have been found to have significantly lower carbon footprints per kilogram of product (Ripple et al., 2013). Specifically, soy and gluten based products produce around 3 and 4 kg CO<sub>2</sub> eq/kg of edible product respectively (Smetana, Mathys, Knoch and Heinz, 2014).

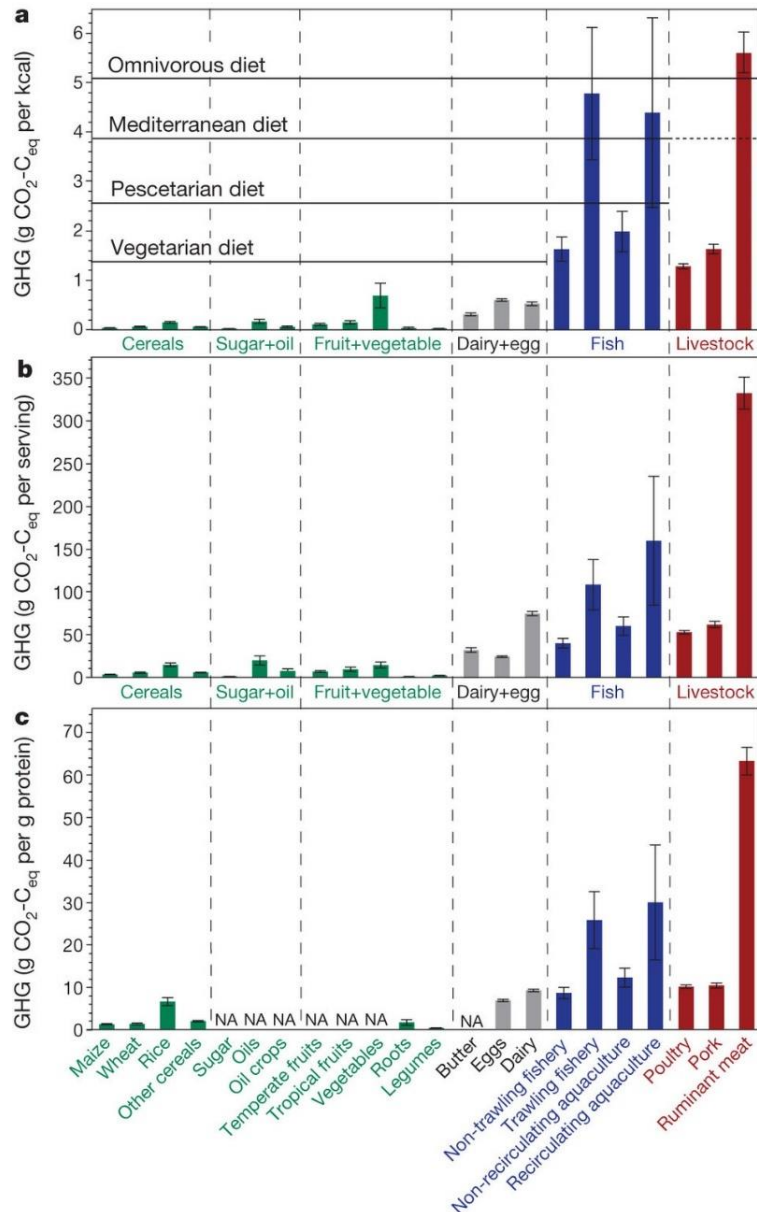


Figure 2. GHG and diet compared by kcal, serving, and protein (Tilman & Clark, 2014, p. 519)

The biggest change in diets clearly would be for those people living in countries that eat the most meat, which are people in the US and the EU. The available meat for consumers, specifically the boneless retail weight of red meat and poultry which is defined as production, minus exports, plus imports, minus production losses, divided by total US population, was equal to 170lbs (77kg) in 2013. This annual consumption rate computes to 7oz (208g) per day (USDA ERS, 2016). A similar calculation for

Italy results in a figure that is much lower at 97lbs (44 kg) per person per year in 2013 which is 4.25oz (120g) per day (Russo et al., 2016) (See Table 1).

Table 1. Consumption amount by meat type and region (USDA ERS, 2016; Russo et al., 2016)				
<b>Meat</b>	<b>Italy 2013 kg</b>	<b>Pounds<sup>1</sup></b>	<b>US 2013 Kg</b>	<b>Pounds<sup>1</sup></b>
<b>Bovine<sup>2</sup></b>	11.69	25.7	24.59	54.1
<b>Pigs</b>	19.47	42.8	20.00	44.0
<b>Poultry</b>	11.60	25.5	32.18	70.8
<b>Sheep and goats</b>	0.49	1.1	0.32	0.7
<b>Horse</b>	0.56	1.2	NA	NA
<b>Rabbit</b>	0.32	0.7	NA	NA
<b>Wild animals</b>	0.06	0.1	NA	NA
<b>Total /year</b>	44.19	97	77.20	170
<b>Total /day</b>	0.121	0.27	0.211	0.47
Note: 1. Conversion is 1kg = 2.2lbs, 2. Bovine meat for Italy includes buffalo				

Regionally, there are differences in personal meat consumption among the Italian population. Using a 24-hr recall method, the 2002 European Prospective Investigation into Cancer and Nutrition (EPIC) study shows that northern Italy varies noticeably from southern Italy. Linseisen et al. report that for the regions close to the Emilia Romagna region (Turin and Florence) there was a mean consumption for of 110g/day (2002). For Emiliano Romagnoli, their average consumption is most likely on par with that of the average for Italians shown in Table 1. In Oregon in 2006, the amount of meat and poultry consumed was estimated to be about 80lbs (36kg) per person per year or about 100g per day (USDA ERS, 2011). This figure was derived from household purchases, but does not include meat consumed away from homes, so consumption is likely higher than 80 lbs for Oregonians.

Since there is high to moderate consumption, this could be seen as an opportunity that needs to be capitalized on to reduce GHG emissions. Looking further into the savings of GHGs of different diets using the LCA method, comparing omnivorous diets to vegetarian diets can reduce output by a range of

21 to 74%, and with a vegan diet, which eschews all animal source foods, a 36% to 90% reduction (Goldstein, Hansen, Gjerris, Laurent, & Birkved, 2016). Of concern to this study are the numbers for the US and Italy. For the US, the vegetarian diet has the potential to curb 33% of GHG output of an omnivorous diet; vegan 53%, and for Italy the numbers showed the highest savings of all the countries examined in this meta-analysis, at 74% and 90% for vegetarian and vegan respectively (Ibid, 2016).

However, others suggest much more conservative estimates of potential for GHG reductions. Pirotti et al. (2015) mirror the findings of lowered GHG emissions in their study. They compared diet categories of “healthy, Mediterranean, and vegetarian” against the average consumption patterns for Italian families, with all of these diets being matched for energy and recommended nutrient intakes by the Italian Nutrition Society (SINU). They conclude with, “The best performance is achieved by the vegetarian diet with a consistent emission 14.55% below the national average and 6.74% below the Mediterranean diet,” (Ibid, p. 512).

## Food Loss and Waste

Not only are the foods that make it into people’s bodies important for climate change, but so are the massive amounts of food that go uneaten. “Without accounting for GHG emissions from land use change, the carbon footprint of food produced and not eaten is estimated to 3.3 Gtonnes [same as metric tons, and equal to 3.3 trillion kg] of CO<sub>2</sub> equivalent: as such, food wastage ranks as the third top emitter after USA and China,” (FAO, 2013). This figure includes losses along the whole life of food from creation through decomposition. The Food and Agriculture Organization defines food loss and food waste as the following:

Food Loss: refers to a decrease in mass (dry matter) or nutritional value (quality) of food that was originally intended for human consumption. These losses are mainly caused by inefficiencies in the food supply chains, such as poor infrastructure and logistics, lack of

technology, insufficient skills, knowledge and management capacity of supply chain actors, and lack of access to markets. In addition, natural disasters play a role. (Ibid, p. 9).

Food Waste: refers to food appropriate for human consumption being discarded, after it is kept beyond its expiry date or left to spoil. Often this is because food has spoiled but it can be for other reasons such as oversupply due to markets, or individual consumer shopping/eating habits. (Ibid, p. 10).

The literature differentiates upstream losses like those that occur on farms and downstream losses which are from those that receive food that has been grown. Solution based conceptualizations further break down the upstream and downstream segments of loss and waste into sectors like retail businesses and consumers or households.

Divided by regions of the world, Cuesta reports that per capita, food waste by weight is the highest in North America and Oceania (NA&O) as well as Europe at 296kg/yr and 281kg/yr (651, 618 lb) along the whole food supply chain respectively (2014). For households in Italy, this has been estimated at 108kg/yr (238 lb) (Jörissen, Priefer, & Bräutigam, 2015) and in the US, it is about 124 kg/yr (273 lb) (Buzby & Hyman, 2012). While Oregonians' waste consists of about 18% derived from food, characterizations to further understand that waste are currently underway in a project led by the Oregon Department of Environmental Quality (DEQ) (Barrows, 2011; Oregon DEQ, 2017).

The FAO estimates that these world regions have most of their losses on the downstream side of the food supply chain, meaning processors, distributors and consumers as opposed to producers and loss due to storage and handling. These downstream losses and wastage account for 57% and 52% for NA&O and Europe respectively (FAO, 2013). This report shows that NA&O and Europe have the largest



consumer waste as a percent of wastage along the whole supply chain of any other region in the world, roughly 40% and 30% (Ibid).

Heller and Keoleian (2015) calculate that in the U.S. alone, if food waste at the consumer and retail levels were eliminated, it would be like removing the emissions from 33 million passenger vehicles. Again, the emissions from this wasted food does not all come from the end of the life of that food, but mostly from all the steps taken to produce it, store it, and get it to people. Scherhauser et al. (2014) used data from a compilation of studies, with indicator foods to identify where GHGs were coming from. The global warming potential (GWP) labeled in Figure 3 is an index that relates the radiative capacity of all the different types of greenhouse gasses to that of CO<sub>2</sub> (IPCC, 2014). Figure 3 shows that even though most food by volume is wasted downstream in these areas of the world, over 80% of the emissions of this wasted food is coming from production, processing and transport rather than from retailers, consumers and waste handlers.

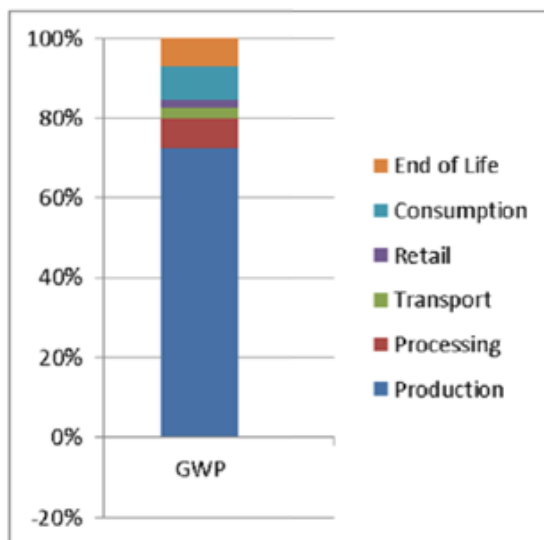


Figure 3. Global warming potential (GWP) of wasted food by sector (Adapted from Scherhauser et al., 2015, p. 152)

## Meat Loss, Waste and GHG

The FAO reports that in 2012, a little over 20% of meat was lost or wasted. Figure 4 shows the amount by weight and sector of the food supply chain in which the loss or waste of meat occurs. It is important to note, that although most meat is wasted outside of the consumer sector, that this is the largest singular sector of wastage. A dollar figure for all US consumers who waste meat and poultry was estimated at \$53,721 million for 2008 which was 45% of all food waste costs for that year (Buzby & Hyman, 2012). Again, looking at volume does not illustrate the full picture of the problem, this figure points to the economic issue of meat waste. When assessing these findings from a solutions perspective, it would indicate that efforts to combat this type of waste would be effective by having a focus on consumers.

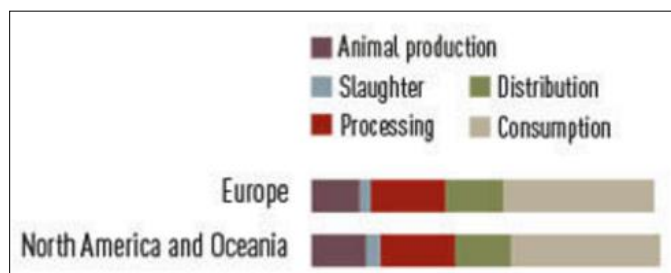


Figure 4. Loss and waste of meat by sector (FAO, 2017)

Targeting meat waste is a strategic move for the environment as well. Despite having such low levels of wastage of meat products by weight, this type of food accounts for the highest amount of GHG emissions when compared to other foods. As already discussed in Figure 3, downstream emissions are not where most emissions occur for all food. This is further backed by Figure 5 which illustrates the results of a meta-analysis of studies from the US and other developed countries combining emissions from products eaten and lost or wasted at the retail and consumer levels by type of food (Heller and Keoleian, 2015). Meat is by far causing the most emissions.

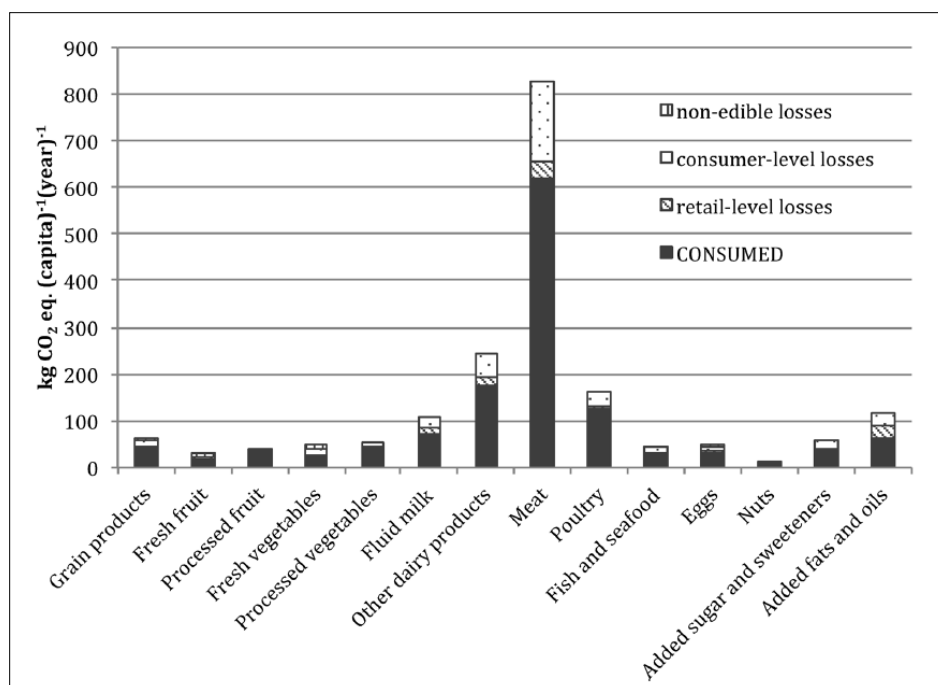


Figure 5. Emissions of products eaten and lost or wasted at retail and consumer levels (Heller & Keoleian, 2015)

The authors analyze emissions by volume. As a percentage of weight of all food wasted and lost at retail and consumer levels, their study shows that while meat represents only 10% by weight, it emits 47% of the GHGs (Ibid) (See Figures 6a and 6b). Meat wasted by retail operations and consumers is the largest contributor to GHG emissions when compared to any other food group. The FAO's report in 2013 compared carbon footprints of regions of nations and came to the same conclusion about GHGs, waste and meat waste for all sectors for the regions of North America and Oceania as well as Europe.

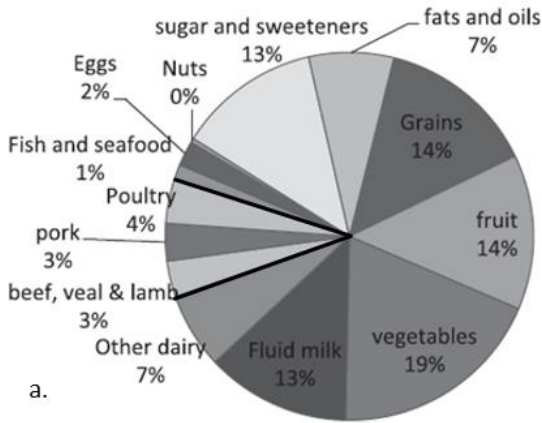


Figure 6. a. Waste and loss by weight

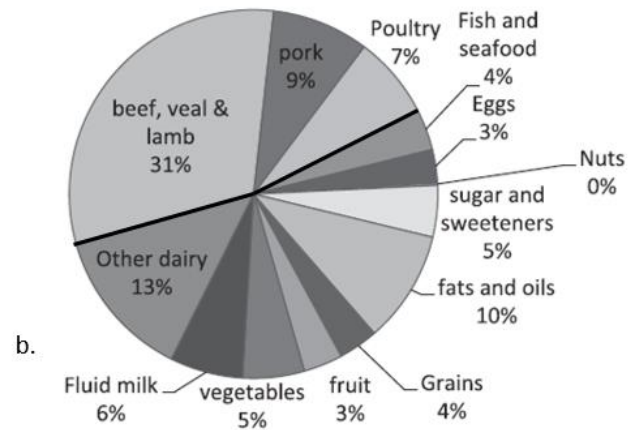


Figure 6. b. Amount of emissions produced of food lost and wasted

These studies do not capture the specificity that is needed when local policies and efforts need to be implemented. Further investigations into the local food system would provide a more accurate assessment of problems that need to be addressed by a particular region. Looking at Figure 6b, beef, veal and lamb are contributing most to emissions. To emphasize the complex nature of these types of assessments that arrived at the above figures using life cycle methodology, beef can be investigated.

Table 2 shows results from four studies published in the last few years. Having research keep pace with practices is important as herd changes can be introduced quickly due to the short lives of the animals generally and to keep up with taste demand, also to be able to capture updated methods of rearing bovine animals. Boundaries for life cycle assessments can differ among studies. For beef and veal sold at the Italian cooperative of grocery stores, Coop, information is published using Environmental Product Declarations that are verified by an LCA consultant. These LCAs encompass an integrated cow-calf operation between farms in central France and Northern Italy and include starting at mother's input down the chain to the consumer, which is ready to eat, packaged, and at the stores (EPD, 2016).

Roop, Shrestha, Saul, and Newman writing of Northwestern US beef productions take one step back from that scope and stop at the end of processing (2014). Others like Berton et al. and Buratti et

al., studying Italian productions use a cradle-to-gate analysis, meaning starting at birth and ending at the sale of the animal to the slaughterhouse (2017; 2016). Scope of the analysis and type of farm based on place are important factors for differing outcomes for GHG production, but so are methods of rearing as discussed by Buratti et al (2016). They compared conventional and organic beef operations. From these studies, the comparison between ER and OR shows similar beef productions in terms of emissions. This could indicate that technological improvements are needed in both areas, but it is likely these are already the most efficient they can be since they were completed in the last few years, leaving only room for behavior change regarding demand of these foods to reduce emissions.

Table 2. Publications of regional LCA research for beef		
Study	Place	Kg CO2 eq/ kg
EPD <sup>1</sup> , 2016	France and northern Italy	Beef 22.50 <sup>2</sup> Veal 22.00
Roop, Shrestha, Saul, and Newman, 2014	Washington, Oregon, Idaho, western Montana, western Wyoming, northern California, northern Nevada, and southern British Columbia	18.75
Berton et al. <sup>3</sup> , 2017	France and northeastern Italy	13.00
Buratti et al. <sup>3</sup> , 2016	Umbria Region (central Italy)	Organic 24.62 Conven. 18.21
Notes: 1. Includes ER region 2. For the same boundary of Roop, Shrestha, Saul and Newman it would be 22.1 3. This is live weight at the farm gate vs packaged as the other studies above it have calculated		

To summarize the technical details described so far about GHG emissions, consumption and waste, livestock account for at least 18% of the world's greenhouse gas emissions, so shifting diets away from these foods would reduce emissions. The people in the US and EU eat the most meat in the world, but at the country level, there are large differences in the per capita consumption per year between the US and Italy. This difference can be examined further by looking at regions of Emilia Romagna and Oregon, and doing so results in the two areas involved in this research not having much difference in consumption of meat.

Measured by volume or weight, most food is wasted by consumers and retailers, but emissions from food mostly comes from upstream activities to grow or raise food. GHG emissions from lost or wasted meat is much higher than any other type of food, but specificity for scope, place and operations type may create LCAs that are not correct for regional level productions. Looking specifically for beef LCAs, ER and OR productions are on par with each other. Regardless of the specificity, meat foods will likely produce an effect on climate change anywhere from two (chicken) to ten (beef) times more than plant proteins. This research contributes to problematizing climate change and food waste which is being addressed at all levels of government.

## Global and National Goals

The United Nations Sustainable Development Goal (SDG) 12.3 proposes, “By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.” This goal statement prompted the European Union to establish a platform for food loss and waste in which they commit member states to meeting this goal (European Commission, 2017a). This goal is set under SDG 12: Ensure sustainable consumption and production patterns. “Sustainable consumption and production” is defined by the 1994 UN Oslo Symposium: “...sustainable consumption and production (SCP) is about ‘the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of further generations’” (United Nations, 2017).

The European Commission justified the move to set this target by announcing in a press release, “Apart from the related economic and environmental impacts, food waste also has an important social angle – donation of surplus food should be facilitated so that safe, edible food can reach those who

need it most,” (European Commission, 2015). The US has also chosen to align with SDG 12.3 under the Department of Agriculture and the Environmental Protection Agency who states, “Reducing food waste will help the United States address climate change, as 20 percent of total U.S. methane emissions come from landfills. By keeping wholesome and nutritious food in our communities and out of our landfills, we can help address the 42 million Americans that live in food insecure households” (US EPA, 2017).

Like the US EPA, the Ministry of Environment in Italy is responsible for monitoring and reporting progress for this target. For the regions of Emilia Romagna and Oregon, this issue is housed under the theme of environment, with waste being handled by Emilia Romagna Regional Agency and Waste Water Services (ATERSIR) and for Oregon, the Department of Environmental Quality. Although fighting food waste may include the added benefit of helping to reduce the social ill of food insecurity, this management structure and the organization justifications seen above show that this is an issue of concern for the environment and climate change.

The waste or loss of food is considered important enough to be addressed in global arenas down to regional ones. However, Lacirignola et al. point out that the details of where, how and why food is lost or wasted, as well as solutions to these particulars, are highly context specific and depend on the country, region and the product under consideration (Lacirignola, 2014). Despite noted differences that can lead to a diverse array of policies or programs to handle food surplus and waste, there is a unifying concept of how to handle surplus food.

The food recovery hierarchy (Figures 7 and 8) was created as a visual representation of the most to the least ideal actions for managing surplus food. Prevention is the top goal. In the European context, the hierarchy for all waste was codified by the European Directive 2008/98/EC in article 4 (Eur-Lex, 2008) and was followed by the adoption in Emilia Romagna under Regional Law number 16 in October of 2015 (BURERT, 2017). In that same year, Oregon passed Senate Bill 263 which outlines the same

hierarchy for waste management in the state, food included. These two laws will be examined further in the content analysis of this paper.

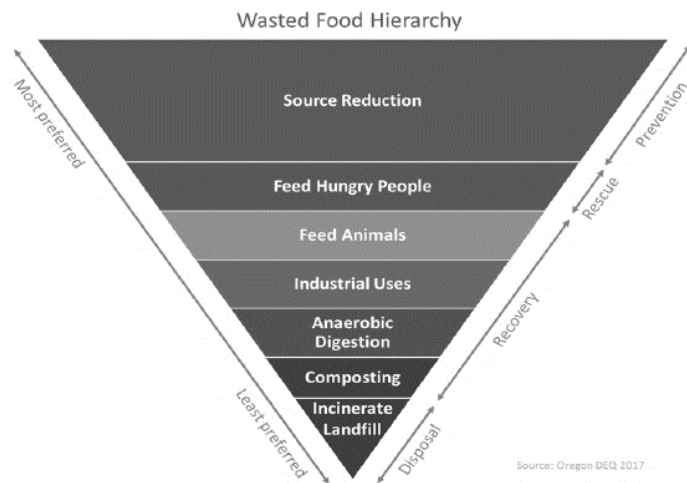


Figure 7. Food Waste Hierarchy (Oregon DEQ, 2017)



Figure 8. Food Waste Hierarchy: Italian language (Segrè, 2014)

## Drivers of Wasted Food and Best Practices

Aiming for the most preferred action, that of prevention of wasted food, researchers have sought to understand why food is wasted, specifically at the household or consumer level due to these sectors wasting much of the food in the EU and the US. Studies uncovered a multitude of reasons for wasting food including attitudes and beliefs of household consumers, as well as awareness and skills



deficits. These studies generally deal with wasted food as a whole, not targeting the type of food wasted.

A survey from Switzerland found that people who intended to waste less, or who perceived they had behavioral control, wasted less, as opposed to those who identified as “good providers” who wasted more (Visschers, Wickli, & Siegrist, 2015). This research recommends that any efforts to change behavior should unite the two motivators of perceived control and intentions and the barrier of wanting to be a good provider. A study of Danish individuals found the same outcomes with relation to perceived behavioral control and intentions. They stated that the largest savings of food being wasted would come from changing behaviors that lead to deficient leftover use resulting from lack of skills in this area (Stancu, Haugaard, Lähteenmäki, 2016). Attitudes about being a good provider were also found in the UK along with, “minimizing inconvenience, lack of priority and exemption from responsibility,” as being barriers to reducing household waste (Graham-Rowe, Jessop, & Sparks, 2014). Adding to the recommendations about skills training, this study finds that communications need to include an underlying motivation that reducing wasted food is “the right thing” to do (Ibid, p. 21).

A Canadian study of suburban households in a mid-size municipality shows that wasting food caused guilt over package waste or other garbage produced when food was thrown away. The order of reasons why they felt guilt about wasting food was first social issues, then economic and finally environmental concerns (Parizeau, von Massow, & Martin, 2014). They also found that these respondents hold individuals responsible for reducing food waste above any other sector. The most popular suggestions where they indicated needing help were mostly in meal planning, changing preferences and habits. Also, different packages are needed when purchasing food (Ibid). They recommend policies that increase education and skill building as well as incorporating the use of social messaging; wasting nutrients and food security issues.

Social and environmental messaging may not work for people in the UK. The top motivator for these people was economic (Quested, Marsh, Stunell, & Parry, 2013). Nine behaviors have been tracked as most influential in wasting food by the Waste and Resources Action Program (WRAP) of the UK. WRAP is a group that has been studying food waste for over 10 years, has established voluntary agreements regionally, and consumer campaigns internationally, along with providing research. These behaviors listed below, span both attitudes and values as well as knowledge and skills. Often, they are influenced by interacting activities in a person's environment including emotional factors (Ibid, p. 45).

- |  |   |
|--|---|
| 1. Planning meals in advance   | 5. Storing apples and carrots in the fridge           |
| 2. Checking levels of food in cupboards and fridge prior to shopping | 6. Using the freezer to extend the shelf-life of food |
| 3. Making a shopping list  | 7. Portioning rice and pasta                          |
| 4. Storing meat and cheese in appropriate packaging or wrapping      | 8. Using up leftovers                                 |
|  | 9. Using date-labels on food                          |

These behaviors were also discussed in a publication by Thyberg and Tonjes who mostly discussed the US context but commented that there are definitive cultural differences in wastage behaviors. People tend to waste more food that they have less connection to. That loss of connection has increased in a more globalized food system. The US has a particularly unhealthy relationship to food placing little value on food, emphasizing the importance of abundance or quantity (Thyberg & Tonjes, 2016) and economic savings. Thyberg and Tonjes report that older people waste less, while single people households, and families with children waste more. For households, they advocate for education and skills on the above behaviors and agree that motivations need to be made on the basis of environmental, social and economic issues (Ibid, p. 120).

In Italy, the Waste Watcher report from 2013 found that the top causes for Italians wasting food were that the food: molded, expired, didn't have a good smell or taste; that they cooked too much; tastes, and preferences related to leftovers; and shopping habits. These causes were also reflected again in 2015 (Jörissen, Priefer, & Bräutigam). The top two solutions to reduce food waste chosen by survey respondents in the Waste Watcher study were improving education in schools and increasing awareness about environment and economic consequences (Adorno & Camillo, 2013).

### Policy Pass Up

Food waste policies and targets are in place to tackle food waste as a whole, since they only name a volume or weight reduction goal. Recommendations on awareness or behavior change materials aimed at consumers have also focused on treating all foods similarly or taking a greater effort to cut down on foods that are wasted more by volume or weight. Given these observations, they are lacking when it comes to the role of targeting foods like meat that are by weight the costliest in their impact to climate change from a life cycle approach.

In a recent commentary on national policy in the US, Hyner (2015) summarizes the situation as it relates to animal agriculture and climate change policies in general, stating that the connection between the two, "is too often left out of the policy discussion". He first points to the US Department of Agriculture and how their climate planning fails to adequately address animal agriculture's contribution to climate change by only going so far as to have voluntary programs. He next points the finger at the Climate Action Plan established by the Obama Administration, in which human related emissions are named, but livestock as a major source of GHGs in agriculture are not. He concludes with saying that the overall policy picture is severely lacking in its ability to target one of the leading causes of human related GHG emissions (Ibid). Key and Tallard (2012) agree with this assessment in the area of carbon taxes and emissions trading schemes. They write that as of 2009, while feasible, "Governments so far have

refrained from implementing technology standards that directly target GHG emissions from livestock. No countries currently tax CH<sub>4</sub> emissions from livestock, and prior tax proposals in New Zealand, Ireland, Denmark and the U.S.A. have met substantial opposition from producers” (Ibid, p. 392).

Ripple et al. report that agricultural contributions to GHG emissions have not been the focus of climate mitigation policies in general. Further, they state that, “little is being done to alter patterns of production and consumption of ruminant meat products” (2013, p. 3). The target on ruminant meat (cattle, goats and sheep) is justified by their exploration of GHG production being over four times as much from ruminants than that from monogastric livestock (pork and chickens), but they still say that compared to plant sources of protein, even those smaller carbon footprint meats are still producing three to four times the GHGs coming from plant foods (Ripple et al, 2013).

The Johns Hopkins Center for a Livable Future is in agreement with Hyner. A report they prepared in advance of the United Nations Conference of the Parties 21 in Paris which looks beyond the US, at the international setting, states, “Intended Nationally Determined Contributions [of GHGs], or INDCs – vary greatly; however, most share one common feature: the absence of wasted food, and the near absence of diet and agriculture, as areas to address in reducing emissions.” They go on to state, “When agriculture or land use change are mentioned, livestock production is not referenced directly,” (Kim, Neff, Santo, and Vigorito, 2015, p. 3). This may be due to similar assessments of food waste as seen above, that these policies are highly context specific, but perhaps there are other drivers at play like perceptions and beliefs of those persons responsible for policies and programs in these areas.

To meet climate change mitigation and emissions reduction goals it is necessary to examine every facet of human contribution to this matter and take proactive efforts in these areas. Eliminating wasted food, and more importantly wasted meat, may serve as a strategic and timely opportunity that fills in gaps for an issue that cannot afford to have gaps if we are to preserve a world for our children

with the same quality of life that people experience today. Even small reductions in the waste of meat would have a sizable impact exponentially larger than reductions made for other types of food.

There may have been systematic exclusions of waste or wasted meat and its connection to upstream emissions due to convoluted linkages among these topics, or there may be other explanations linked to biased decision making and beliefs in the policy processes or programmatic understanding and goals. While it seems that policy makers and others that are charged with tackling emissions would jump to remedy what they can in this area, there may be cause for the lack of attention or action in this area. An explanation for this observation may lie with understanding how the organizations involved in these areas view this type of meat or meat in general and the relationship to mitigation strategies for climate change that they believe would be appropriate. Since food waste is a problem of the public it is appropriate to guide research into this observed shortfall by understanding core concepts of policy frameworks that theorize on the social and psychological nature of policy making.

## Literature Review

The theoretical basis that guides this study relies upon some of the concepts presented within the literature about policy process frameworks and theories. One framework especially highlights and exemplifies echoing themes that appear among many others: The Social Construction Framework. This section begins the review of literature and describes conceptualizations of major players involved in the policy process and how these people could demonstrate subjective mechanisms like perceptions, beliefs or values at all stages of the process of policy making.

### Public Policy Frameworks and Beliefs

Understood as the sociology of knowledge, social constructionism introduced by Berger and Luckmann established that social interactions create what is real and true for people, and then they

habituate in these circumstances creating institutions (Maquet, 1968). From this point of view, infants are born into an objective reality which is in fact a subjective world co-created among the members of a given society. The meanings and definitions assigned to food, and waste of that food, as well as defining relationships with animals and the meanings that meat has for people are characteristic of a particular society of people.

The Social Construction Framework (SCF) for understanding public policy molds these foundations and focuses strong attention on who experiences the intended consequences of a policy, be they positive or negative, based on society's or more importantly, policy makers' perceptions of that group of people. The four-quadrant model used by SCF contains axes in which groups of people are placed based on their high or low power and positive or negative popular image (Sabatier & Weible, 2014). Schneider and Ingram who established the framework describe that the stereotypical shared characteristics of a group can have inherent goodness or badness attributed to them and thus will delineate that group's deservedness of policy benefits or burdens (1993).

The core propositions of the framework have been validated as it has been used to explore policies about a wide range of target groups as varied as gay men with AIDS, Japanese immigrants, middle class African Americans, and criminals (Pierce et al. 2014; Sabatier & Weible, 2014). For example, Sabatier and Weible describe Cooper's writing and how health policy, which can be expected to be one of the most unbiased policy subsystems can differ in real, tangible ways such as treatment, based on the group that will receive care (2014). When describing the origins of the framework and how it is grounded in the disciplines of psychology and social psychology, a conclusion is made that, "...bias, labeling, stigma, and stereotyping exist in the way humans think and interact, and public policies are only one of many mechanisms that reflect and reinforce them," (Ibid, p. 122). Public policy or programs aimed at changing public behavior in the realm of food waste is no exception.

To summarize, research shows that people are far from rational in their thinking in that they are reactionary with feelings and emotions which are derived from one's various groups that they belong; cultural, professional, etc. and this is especially true if an experience is new which may set the stage for the way someone thinks about an idea from that point on (Sabatier & Weible, 2014). This framework like many others, acknowledges that people may never have the full picture, but are required to make decisions, thus they tend to employ mental shortcuts based on biases, or experience and utilize the information that they have right at that moment (Ibid). These two concepts are known as bounded rationality, and heuristics.

The *who* of the policy process in policy process frameworks can be a narrow definition or a wide one depending on the framework and context. Elected officials, and public officials, are who hold the decision-making power in SCF (1993), but the framework also mentions that the group receiving benefits and burdens has an image that is defined by society at large. This could mean that every person is implicit in creating policy. This study mostly uses the former rather than the latter definition of who makes policies and defines stakeholders as those who are or could be engaged with food waste policies and programs; i.e. policy makers, public administrators, and experts.

From the creation of the term food waste all the way to the myriad programs and policies in place to combat the formation of it, humans have used their boundedly rational minds and have employed heuristics to guide decisions every step along the way. All of these types of people in the policy process described above are to varying degrees susceptible to bias and to creating biased policy whether at the time of the decision to adopt a policy or not adopt one, or in building up the knowledge and context about the policy situation.

## Stakeholders, Meat Consumption, and Climate Change

This section outlines analyses that have been completed on stakeholders that would be concerned with meat production and climate change, and those involved with environmental issues. These studies cover developed countries in the regions of North America and Northern Europe. These are meat eating cultures too. Drawing upon the first study discussed in this section, the methodology of looking at all types of interested parties to try and capture all aspects of the topic was used in this research as well. Certain findings here were noted also as possible themes to look for during interviews with the participants of this study.

A recent study on stakeholders in Sweden sought to elucidate their views on climate change and mitigation through meat production and consumption (Lerner, Algers, Gunnarsson, & Nordgren, 2013). Their stakeholders included representatives from twelve organizations that can be generally categorized as meat producers, non-governmental organizations such as farmers' associations and interest groups like The Swedish Vegan Society, as well as members of government. The authors write that reducing beef production despite being acknowledged as the worst offender is not an option for all but one of these organizations and they detail how organizations' answers indicate that the complicated nature of the topic cannot lead to clear cut answers while stressing the benefits of grazing and the options for feed innovations (Ibid, p. 666-669).

The next major theme that they found, geared toward the topic of meat consumption rather than production, was how organizations were advocating for "less but best" while only one said eating no meat is acceptable, because they believe that Swedish meat is some of "best" in terms of climate impact while the country is importing 50% and this figure is increasing recently (Ibid). These stakeholders believe that incentive-based mechanisms rather than regulatory mechanisms should be used and that change would occur slowly but surely. Throwing out less food was mentioned as an



approach rather than eating less meat, but linking of the two ideas was found when speaking for animal consumption of food that would go to waste (Lerner et al., 2013, p. 670), not that waste of meat itself needs to be the focus of future efforts. Lerner et al., conclude that defense of Swedish meat is overemphasized when factually analyzed and these stakeholders follow their interests and values when advocating for solutions to climate change mitigation as it relates to meat. This conclusion indicates what to look for in stakeholders involved with food waste and climate change.

A study to look at NGOs in Sweden, Canada and the US analyzed decision making to campaign for reduced meat consumption as it relates to climate change (Laestadius, Neff, Barry, & Frattoroli, 2014) and a thesis about environmental organizations examined NGO's limited tactics on this topic in Norway (Dørheim, 2014). Laestadius et al., chose their participants to analyze political and cultural influence in nations with different backgrounds who had diverse goals about animal protections, the environment and food. This current study borrows from the first NGO research by taking on a cross-cultural study as well, but differs from this methodology by concentrating on one policy subsystem like that from Dørheim.

The findings from the first instance, show that their participants' understanding of meat consumption and contributions to climate change, was not sufficient to warrant the NGOs' interest in adopting campaigns on this combined issue (p. 38). Lack of public interest and concerns about effective outcome of these campaigns were barriers to adoption along with fear of seeming too preachy when targeting personal behavior change. Dørheim analyzed how NGOs perceived the potential for cognitive dissonance among their supporters and how that could harm membership, thus the topic was minimized (2014). Borrowing from these studies, it was important to analyze how the participants in this current study understand the needs of their regions.

## Stakeholder Perceptions of Wasted Food and Meat

To date there has been a lack of research with a critical lens that examines decision making of stakeholders who are involved with food waste efforts aimed at household consumers. Another area where there is a deficit in understanding about stakeholder decision making is in the linkage of the environmental focus of wastage of food and that of wasted meat. One study summarizes the current descriptive approach to analysis of this stakeholder group. Evans and Welch (2015) conducted interviews with around 40 stakeholders in the UK working on food waste reduction who focus efforts on household waste. They wanted to know how these stakeholders defined the issue of food waste. They state, “The way in which problems are framed shapes perceptions of plausible solutions, whilst excluding other possibilities” (Ibid). Overall, they find that problem framing has a broad consensus among civil society organizations, policy makers, retailers and consultants.

The issue of food waste has been taken up by many types of stakeholders relatively recently; by those that investigate and define the topic, by various sectors that create wasted food, and by those charged with informing the public or changing public behavior. This study borrows from NPF to understand and define decision making capacity in a proactive way, but it also incorporates the SCF in the intersection of food waste and meat eating. Meat foods are socially and culturally defined and are important foods, therefore any policy aimed at the wasting of these foods could distribute benefits and burdens unevenly both through intended and unintended consequences like contributing to climate change.

There has been a lack of targeted policies and programs aimed at the wastage of meat and its upstream impacts, namely that of emissions from livestock. Employing the use of policy frameworks, the problem may lie in biases that are held with the stakeholders in this policy subsystem around the value of meat foods given a particular cultural context where meat eating is the dominant norm. The theory of

carnism has recently been positioned to explain these biases and how they are socially constructed and reinforced through psychological devices.

## Carnism Theory

We don't see meat eating as we do vegetarianism, as a choice, based on a set of assumptions about animals, our world, and ourselves. Rather, we see it as a given, the "natural" thing to do, the way things have always been and the way things will always be. We eat animals without thinking about what we are doing and why because the belief system that underlies this behavior is invisible. This invisible belief system is what I call carnism. (Joy, 2010, p. 29).

Carnism is a social psychology theory first articulated by Joy in 2001. As a theory, carnism is still in its infancy as researchers explore applications in empirical works. As the previous section has shown with social constructionism, Joy also follows the understanding that, "...our perceptions determine, in large part, our reality; how we perceive a situation—the meaning we make of it—determines what we think and how we feel about it. In turn, our thoughts and feelings often determine how we will act" (2010, p. 13). This way of thinking is a set of heuristics about food and animals.

Joy explains the human psychology about the eating of non-human animals and how that is socially constructed and reinforced. Ruby and Heine also found social influence to be a strong positive predictor of the willingness to eat meat among Euro-Canadians and Hong Kong Chinese (2012). A few generalizations that Joy uses are that all people do not want to see animals suffer and they care about them, but they also eat them (p. 18). A recent study shows that the appropriate animals to eat varies widely across cultures (Amiot, Bastian & Albarracín, 2014). Nationally, with the exception of horses, the US and Italy generally define edible animals similarly as livestock such as cows, pigs, chickens and sheep or game animals such as venison, and rabbit. It is likely then that people from the US and Italy both perceive meat and the consumption of it in the same way, act according to those beliefs and continue on steadfastly.

Despite any cultural differences, Joy explains that if animals are eaten, two major mechanisms help people reconcile their beliefs and actions: (1) People's minds hold a schema that classifies animals in a binary system; edible or inedible (Joy, 2010); (2) People engage in psychic numbing: "denial, avoidance, routinization, justification, objectification, deindividualization, dichotomization, rationalization, and dissociation" (Ibid, p. 19). People generally feel that humans are the most intelligent species and so psychic numbing through dissociation that was found in Ruby and Heine's study shows that perceived animal intelligence decreases the likelihood that a person will eat that animal (2012) and that most animals used for food are perceived as less intelligent (Joy, 2010; Plous, 1993).

Three main justifications to eating meat are discussed by Joy. She writes that eating meat is generally considered normal, natural and necessary. Piazza et al. add another reason people routinely give as to why they eat meat; that it is nice (the 4Ns), and they look at relationships between these and attitudes held by these people (2015). In two arms of their study, including this fourth justification, they find that the 4Ns account for 83% and 91% of the total reasons people gave for eating meat.

For the adults in their study with a mean age of 34 years old, the necessary justification was invoked the most at 42%, then natural at 23%, nice 16% and normal being 10%. Other reasons they found were for religion, the sustainable nature of meat, humane slaughter, and miscellaneous justifications. They found that ethical concerns for the environment or for animals themselves was less of a motivation when making food choices in people who invoked the 4Ns, and these people "were less likely to be moving toward greater restriction of animal products in their diet" (Piazza et al, 2015, p. 125). These four justifications were utilized and expanded upon in this research.

Moving forward in descriptive analysis, a carnism Inventory was created to measure carnistic defense as in the 4Ns seen above, and carnistic domination and how that relates to other ideologies that people have. Carnistic domination was a predictor of having slaughtered an animal and is proposed as a

deeper hierarchical belief that involves subjugation and ideas of dominion over animals, while carnistic defense allows people to consume meat (Monteiro, Pfeiler, Patterson, Milburn, 2017). They describe these as two sets of beliefs where one justifies eating and the other justifies killing animals.

They found that both of their scales, “...were significantly related to sociopolitical beliefs, including right-wing authoritarianism and social dominance orientation, but only carnistic domination was related to symbolic racism and sexism,” (Ibid, p. 51). The scales utilized, Ambivalent Sexism Inventory, Symbolic Racism, Right-Wing Authoritarianism and Social Dominance Orientation have been established as validated scales of political and social ideologies. Since policy is the focus of the current research it is important to carry forward this idea and understand the political context of each region and how that may influence participant understandings of the wastage of meat.

The propensity for eating meat may also stem from the fact that people perceive this product as less harmful to the environment in general compared to other food behaviors, and as having no impact on climate change (Siegrist, Visschers, & Hartmann, 2015). Swiss people in this longitudinal study found that they think reducing meat consumption would have the lowest environmental impact when compared to other behaviors like choosing local foods and reducing packaging in 2010 and again in 2014. They report that positive factors related to the belief that reducing meat consumption is better for the environment, were the beliefs that this action is also healthier and better for animal welfare (2015). The authors conclude, stating that Swiss consumption of meat is above average, 75kg/person/year as of 2009 and this may affect their perceptions. As Oregon and Emilia Romagna also have high meat consumption perceptions about environmental impact of meat may be affected among these stakeholders as well.

Because food waste can be couched under the larger field of sustainability, it is plausible that the leaders in this area may have been drawn to work in this area given their beliefs, or have been

exposed to sustainability concepts while performing their work. If these leaders are more aware of the environmental impact of meat and express concern for the environment as a reason to fight against food waste, they may be less likely to invoke the 4Ns and more likely to accept advocating for focused messaging on meat waste. Joy describes carnism as the dominant and entrenched ideology for most people. For both the Oregon and the Emilia Romagna participants, eating meat is for the most part a choice, so there should be an appearance of these mechanisms and carnist viewpoints in the way that these participants discuss their food habits as well as how they understand the culture that they are a part of.

One final underpinning of the theory of carnism from Joy's critical perspective, is that the violence and oppression imposed by actors in carnistic systems is similar to that seen in racism and sexism. These belief systems are created from maladaptive ideologies. People with these types of belief systems seek to perpetuate and legitimate the problems that emerge as consequences of their actions in their social norms and institutions which are culturally or regionally specific. Views of minority or female humans as "less than" are maladaptive in terms of society optimizing. The case of dress codes at school in the US that penalize young girls and send them home to change their clothes, can impact learning and teaches young boys that they are less than capable of controlling their own sexual thoughts and behaviors.

In oppressive systems like these, the oppressor makes pleas to the natural order of the world as they understand it, e.g. "boys will be boys" mindset. Implicit biases in the minds of people engaged in the system in turn form social constructions of what it means to behave in a given society. Moreover, the oppressors will seek to perpetuate the system for their own real or perceived benefits, not grasping the full gravity of the lose/lose condition they have put themselves and others in.

Like biases about women, views of animals as “less than” and food animals as even “lesser” than that of companion and wild animals, lead to food consumption patterns and waste streams that allow for the continuation and escalation of harmful GHG emissions. Therefore, if the waste of meat is consciously or unconsciously ignored and the effects of the wasted resources are either overlooked or minimized due to people’s bias against animals and toward meat foods, the point of no return will come and go in lightning speed, causing the whole planet to suffer the devastating effects of climate change.

The present study aims to empirically examine hidden philosophical biases that might explain similar outcomes in food waste policy in both Emilia Romagna and Oregon, and how carnism may be implicitly shaping these policies. It is important to understand decision-making processes of stakeholders in the food waste policy subsystem because they are identifying the problems, uncovering the solutions that will resolve those problems, and relying on their beliefs about the larger issues and the people that they are acting upon and are held accountable to.

Much of the literature that is defining carnism is based in quantitative studies; Piazza et al, 2015, (an open-ended survey); Monteiro, Pfeiler, Patterson, and Milburn, 2017; and Ruby and Heine, 2012. The use of quantitative analysis seeks to generalize to the public, defining beliefs about eating animals and how this is related to beliefs about human-human interactions and social order. The qualitative methodology of this current research allows for a wider degree of issue definition that straddles the line between exploratory grounded theory research and quantitative methods. In this study, certain terms and questions were left decisively indefinite to uncover trends among these groups and to allow for differences of culture or beliefs between the two groups to reveal themselves.

Ideologies may not directly translate into intentions for action or completed action. Previous work on carnism theory has been correlational. This study looks at the next link from beliefs to intended actions. This research adds to the literature with another illustration of socio-cultural contexts of meat

eating and stakeholder beliefs like the study by Laestadius et al. By analyzing a certain subset of the population, unknown variation among the participants may be controlled along with political ideology which can then allow for the revelation of the consequences of beliefs. By using a comparative design of stakeholders in a defined policy subsystem, analysis of the degree of beliefs between like-minded individuals is possible because they may differ from the general population of which they are a part of in their respective regions, but have similarities among themselves that are cross-cultural or culturally specific.

## Hypotheses

Two main hypotheses were purposed to answer the questions of why meat waste is not a priority in the food waste policy subsystem and whether stakeholders would support food waste policies aimed at addressing food that has more environmental impact.

1. If a person believes that food waste is a problem because it contributes to GHG production or uses too many natural resources, then the wastage of meat would be recognized as a major category to focus food waste mitigation strategies on.
2. If carnism is a shared ideology, then food waste mitigation strategies aimed at the wastage of meat;
  - a. Would not be identified,
  - b. would not be seen as viable options,
  - c. would be purposefully ignored, or
  - d. would receive less attention than other types of food that are wasted.



## Methods

### Policy and Stakeholders Definitions

To grasp the larger scope of food waste management, the goals, and parties involved, it was necessary to broaden the scope of what is a public policy to encompass policy as a whole. Although, if public policy can also be defined as what a government does not do (Smith & Larimer, 2013), this research can also be defined as a public policy stakeholder analysis. For the purposes of this research, policy is defined as: A law, initiative, voluntary agreement, resolution or program which has been or will be formulated, adopted or carried out and targeted toward the ER region at the regional level or the level of municipalities or local authorities. For the Oregon context, this list would be the state, municipal or local level for the same types of formal and informal rules. Stakeholders are: those engaged in policies about food waste in government or nongovernmental organizations.

### Region Selection and Context

Contextualizing the cases is important in international comparative research (Salway et al., 2011). Certain contextual features show the similarities and differences that may prove to be important for both Oregon and Emilia Romagna when interpreting the results. These similarities will set a certain amount of control that can allow for outcomes found to be more closely attributed to the factors being analyzed. There is a danger of cross-cultural and cross-national research of introducing many unseen confounding variables that will erase or blur any relationships that can be found in the study, but if relationships among dependent and independent variables do persist among different nations and cultures, then the findings are more robust.

The assumption of cross-national difference could be outright false. Gómez and Kuronen as well as Hantrais before them, point out that even within country differences could actually be more prevalent than across country ones (2011; 1999). Political, economic, and other systems at the

subnational level can change the social and cultural behaviors of the populations with which they encompass and therefore should be acknowledged (Hantrais, 1999).

Following this logic, any individual that is part of a sample does not necessarily represent their given culture or region under study. This may be even more likely with this study because the participants are likely to be affluent as people with regular employment and likely to have higher educational achievements especially among the expert/scientist category. It is likely, these affluent populations have come from different areas and cultures, rendering the contextualization of place arbitrary. Since these participants are acting to manipulate the publics within a geographic boundary, it is likely that they would make decisions based on the population served by them and would have an understanding of the needs of that population. Bias toward one's individual ideology may be curtailed during the performance of one's duties on the job if they are in public service roles.

A globally recognized Food Waste Innovation Center (Centro per l'innovazione dei rifiuti alimentari) at the University of Bologna provides an excellent opportunity and rationale for comparing Oregon and Emilia Romagna (DISTAL, 2017). Do stakeholders in a place with a longer and more coordinated history of food waste reduction and prevention efforts have different ways of conceptualizing food waste and the larger themes of climate change and diet?

More importantly, as previously discussed, developed nations such as the US and Italy, have similar issues and goals for the prevention of wasting food and reduction of GHGs. Consumers, as a distinct sector, waste the most, they release the most GHGs, and they eat the most meat when compared to people in developing nations. Food waste has been problematized and politicized in both the US and Italy.

For the US, 13% of respondents to a poll in 2013 reported that they are vegetarian, while when asked about never eating meat, a more recent poll from 2016, shows that 3.3% are vegetarian (Public

Policy Poling, 2013; The Vegetarian Resource Group, 2016). The research institute EURISPES' yearly report last year found that 7% of people in Italy identify as vegetarian (2016). Nationally, Italians may value meat less than the US. Thus, there was a possibility that meat would be valued differently by each of these regional cultures as well. Moreover, one might anticipate differences based on the face value of the associations that come with "American" food vs. "Italian" food that is stereotyped to be western frontier land with burgers and fries, opposed to the pastoral land of pasta, olive oil and wine.

However, the regions evoke stark contrasts to their national representations. Oregon's fertile Willamette Valley hosts multitudes of hazelnut groves, blueberry fields and wineries far and wide with salmon running in the Columbia River giving rise to the flavor of Pacific Northwest cuisine. Cities of Emilia-Romagna like Parma, are known across the globe for their contributions to the food world such as parmesan cheese (parmigiano reggiano) and prosciutto (prosciutto di Parma) while the city of Bologna brought tortellini, Bolognese (meat sauce) and bologna (mortadella) to the world.

Some general facts comparing each region that may matter in the way these two places express carnism or understand food waste and climate change are represented in Table 3. Oregon is over 10 times the size of ER, but the regions have nearly the same population. Thus, the population density could influence the urgency in the need to address food waste perhaps from an environmental perspective as landfilling options for waste run out. Considering the economic impact of agricultural production in both regions reveals that crops outpace animal products, but still are very important to the economies of the regions. Quality of life and health may be similar for these regions as life expectancy is about the same, but income inequality seems to be greater for OR than ER. Oregon has half the number of unemployed individuals as ER does, but double the amount of people living in poverty. In the political landscape, there are many similarities among Oregon and Emilia Romagna. There are analogous local government autonomies, level of government and type of oversight of waste management, and seemingly similar political ideology.

Table 3. Comparative regional statistics		
Facts	Emilia Romagna	Oregon
2016 Population	4,448,146	4,076,350
Population density	513 people /sq mile	42 people /sq mile
Area	8,669 sq miles <sup>1</sup>	95,988 sq miles
Age	45.6 mean in (2015)	39.1 median (2015) <sup>2</sup>
Life expectancy	83	81 <sup>3</sup>
Median HH income	€27,911; (2014) \$32,991 <sup>4</sup>	€43,351 \$51,243 <sup>2</sup>
People in poverty	6.8% (2016)	15.4% <sup>2</sup>
Unemployment rate	7% (2016)	4.5% (2014)
People who are food insecure		15.2% <sup>5</sup>
Crop v. Animal farm output	Crops €3.1 Billion Animal €2.5 Billion <sup>6</sup> (2014 2% of GDP)	Crops \$3.1 Billion Animal \$1.8 Billion <sup>7</sup> (2015 1% of GDP)
GDP	€146.8 billion (2014)	\$216.5 billion <sup>8</sup> (2015)
Notes: Year given in brackets represent the year of the data. Facts from Istat, 2017; Oregon Secretary of State, 2017 exceptions: 1. European Commission, 2017b; 2. US Census, 2015; 3. OHA, 2012; 4. Conversion rate August 2017; 5. Gundersen, Dewey, Crumbaugh, Kato, & Engelhard, 2016; 6. European Commission, 2016; 7. USDA ERS, 2017; 8. US Bureau of Economic Analysis, 2017		

### Political Comparison

The US is a constitutional federal republic and Italy is a parliamentary republic. Oregon amended its state constitution in 1958 and by state law in 1973 to allow for “home rule” authority where counties now have the highest degree of local discretionary authority of any other state (Oregon Blue Book, 2017). A “loose federation of autonomous regions” is how the republic in Italy was first established, but since 2001, there has been more power given by constitutional amendment to the regions of the nation which established the principle of subsidiarity (Groppi, & Scattone, 2006). Depending on the subject, this could mean extensive decentralization and allows for the most local government capable to address the matter.

For Oregon, the solid waste management authority is held with counties, cities, and metropolitan service areas in agreement with the state government through the Department of Environmental Quality (DEQ) which has a regulatory role (ORS 459 and ORS 459A). In an analogous structure, the Italian group that carries out functional processes like the DEQ is an organization called

L'Agenzia regionale per la prevenzione, l'ambiente e l'energia dell'Emilia-Romagna (Arpae Emilia Romagna) which roughly translates to: Regional Agency for the Prevention, Environment and Energy of Emilia-Romagna. It oversees management of waste that is the responsibility of the local governments; provinces, and municipalities (Arpae, 2017).

The regional government in ER today has most of the seats held by left leaning parties at 64%. Out of 50 seats, 29 are from the Democratic Party (Partito democratico), 2 are from the Italian Left (Sinistra Italiana), and 1 is from L'Altra Emilia-Romagna (Regione Emilia-Romagna, 2017b). This Democratic Party aligns with democratic socialism rather than more centrist democratic political ideology and has historic roots in communism. In Oregon's two-party system, 58% of the state legislators are Democrats. From the 2016 presidential primaries both republican and democrat, Bernie Sanders, a self-described democratic socialist won the most votes in Oregon (The New York Times, 2016).

For Oregon, there is a political divide between left and right, which is represented geographically generally along the Cascade mountain range, and among rural and urban populations. This divide may be less present in ER due to the population density of the region, and a larger majority leaning liberal. Representative politics when working well, is in a continual feedback loop with the beliefs, values and needs of the populations it serves. Given the left leaning dominant politics in both regions the results may find pro-environmental beliefs, but most likely more so with ER. Animal rights may be more of a concern too, which could result in lower strength of carnism beliefs and a favorable position to targeting meat foods in food waste policies and programs.

One aim of cross-national comparative research is to elucidate the international or globalized nature of problems in society. As stated by Rihoux (2006), two strengths that qualitative comparative analysis (QCA) has are that this method is particularly powerful for theory testing, and also for

expanding the theory with new assumptions (Mills, van de Bunt, & de Bruijn, 2006). Unfortunately, the strength of qualitative work in finding nuanced explanations for an outcome, along with testing and expanding theoretical concepts, can be lost across language interpretations, especially since meaning making is one of the central features of qualitative analysis (Haak, Himmelsback, Granbom & Löfqvist, 2013; Gómez & Kuronen, 2011). Szalai, Petrella, Rokkan, and Scheuch call for explanations of methodology to overcome these barriers to be presented in research communications to contribute to the body of literature in this area (1977). The following sections outline how the research design and procedures sought to overcome these barriers to valid findings.

## Data Collection

### Population Sample

Policy makers and public administrators can inspire or dissolve policies, even though they are not experts in the specific topics addressed by those policies. They can be described as people who most likely have good judgement about their job and the people they serve, and judgements can be made based on beliefs either consciously or unconsciously. Scientists and other leaders of NGOs, CSOs, etc., can provide information for the development of policies and be the ones who interact with consumers more directly than policy makers or public administrators. They all have the ability to define an issue such as food waste by either focusing research and developing policies in certain ways or by funding these.

### Recruitment

Purposeful sampling strategies that were used are: (1) deductive theoretical sampling and (2) key knowledgeable and reputational sampling (Patton, 2015). Given the current area of interest in food waste and with the inclusion criteria being that the person has, is, or could be working toward food waste management in some way, assumes that these participants are informed about food issues in

general, and food waste specifically. This sample of the population can substantiate or refute theoretical constructs of the theory of carnism by analyzing two different cultural contexts.

In Emilia Romagna, the University of Bologna has been a major source of food waste research and mitigation efforts for both the region, the nation, and internationally. Dr. Matteo Vittuari, Senior Researcher at the Dipartimento di Scienze e Tecnologie Agro-Alimentari has published widely about food waste and many other related topics. He is a part of multiple projects on this subject, agricultural and rural policy as well as rural development, and directs a team of researchers doing the same. He directed the initial purposive list of stakeholder organizations and participants. Due to the shortened timeline, it was of the utmost importance to develop a contact list quickly and efficiently using the key informants at UNIBO.

For the ER portion of the data collection, recruitment materials that invited potential participants to be a part of the research project included Dr. Vittuari's and the University of Bologna's names. The purpose of that was to gain access and leverage the good name of the University. Each potential participant was sent an email request for an interview. Appendix A and B have the Recruitment and Consent document content both in English and Italian. To minimize potential bias due to language constraints, language preference for the interview was sought and an interpreter was offered if they indicated there was a need for this service.

The purposive list of potential interviewees for Oregon was loosely guided by the kind of people and organizations that were interviewed in Emilia Romagna as well as identifying organizations that manage waste in Oregon. This was done to minimize heterogeneity among the two groups to be able to uncover true variation across regions. Participants in OR self-selected based on recruitment information and were asked who they would recommend including in the study. Those recommendations were

combined with information available via internet searches as to who operates programs about food waste or who has left testimony or voiced support for any bills about food waste in the past few years.

For policy makers in both regions, it was first asked of staff that worked with the legislators or councilors who would most likely be informed about food waste. This was also cross-referenced with information in the public domain about recent bills that addressed food waste and which committees or policy makers were involved in those work groups or deliberations. Two laws that have been made most recently are SB 263 passed as of January 2016, in Oregon, and Regional Law no. 16 in ER in October of 2015. Access was problematic in OR because of the window of time in which the interview data collections fell; the month of March. Oregon has periodic legislative sessions and the state does not have legislators working on a year-round basis, so their schedules are very full during these sessions. This resulted in only one policy maker agreeing to be interviewed.

### Interview Guide Design

In a first draft, an interview guide with 28 open ended questions containing five major categories was created after some initial investigations into the topic of food waste. The five categories of questions are: (1) General (2) Food Waste (3) Climate Change and Diet (4) General Food Preferences and (5) Meat Questions. All five of these categories remained in the final version interview guide. Interview questions were translated into Italian by a native speaker to that region, and in the end three vetting sessions were accomplished for input on content, clarity and construct equivalence by three separate native speakers to the region (Mills, van de Bunt, & de Bruijn, 2006).

The interview guide was initially piloted with two policy makers in the Emilia Romagna region solely in Italian with a facilitator to limit length of time for these sessions. These interviews were used in the final analysis. Based on those preliminary findings, and due to time constraints, a need for a more direct focus on the main research question and the focus on a theoretically based line of reasoning



addressed in this study, the guide was changed to include seventeen main questions with nine sub-questions.

In total, five interviews were found to be unique compared to the others. As stated above, two were pilot interviews which contained questions that were subsequently cut. These were translated after the interview session. One interview was taken via email correspondence in English with one round of clarifications and further probing. Two additional interviews required the use of an interpreter.

### Interview Content

The hypotheses outline a logic pathway that requires interview questions to uncover stakeholder knowledge and beliefs about: problematization of food waste, meat as a food type that consumes more resources and contributes more GHGs than other foods, meat eating culture and history personally and regionally; and finally, the acceptability of targeting meat in food waste policies and programs. Questions nine through seventeen were designed to look for cultural context, any emotive answers given about meat, the multi-faceted values of meat compared to other foods, direct theoretical questions that carnism would predict and if carnist ideology would be perpetuated when challenged. Overall, these nine questions were there to ascertain if and how meat foods are perceived as special foods. The full interview guide in English can be found in Appendix A. and the Italian translation in Appendix B.

### Interview Procedures

Interviews were conducted by first obtaining verbal consent for permission to record them and to be personally identifiable. No participant objected to recording, but one wanted to remain anonymous. Each person that was interviewed in ER received physical copies of the questions in both English and Italian at the time of the interview to facilitate communication. Written words are often more easily understood than the spoken ones by the interviewer.

Participants in OR were also given a copy to read at their own pace and to look over to formulate an answer. This technique may have served to lessen the power differential or any uncomfortable feelings associated with the interview structure as they could see exactly what was being asked, and they could go at their own pace, not having to memorize the question. They could also review the guide a final time when they felt they were done speaking to see if they had answered all that was asked of them.

The interviews were completed in one meeting. Follow-up questions were asked for clarity and understanding during the interview, but participants were not contacted again to answer any probing questions. Interviewees were only contacted to review their transcribed answers and were given the opportunity to change any answers that they had given during the live interview. Those changes were used in the analysis.

Question order was never varied and this was intentional to gain information on increasing specificity. Also, the order was designed to not influence answers stated at the beginning given the nature of the questions at the end. For example, if people were aware that the aim was to talk about climate change and high GHG foods, then they may have focused on those topics as the reason food waste mitigation is important rather than to answer what is most prevalent to them.

To gain access and trust, and to maintain transparency, anyone who requested to view the interview questions before the interview was sent the questions. One person responded via email. Six participants were given the questions prior to meeting with them. It seemed from their responses and actions, as they read the questions while we conducted the interview, that only two people read the interview guide beforehand.

## Data Analysis

### Coding

This study used an iterative coding process that was both prefigured and emergent to be able to test and expand the theory of carnism as well as to test the hypotheses proposed (Creswell, 2013). The interviews were coded to uncover strength of the carnist ideology, for their reasons why to work towards solutions on the issue of food waste, and whether they support targeting meat in food waste mitigation policies. Other major themes that lend to the understanding of what this topic means to the participants were uncovered and are discussed in the analysis section including how they understand the public needs for awareness and behavior change, along with feasible solutions to issues about this topic. Emergent Codes arose out of the interviews during conversations and through content analysis. The prefigured codes pertain to carnism theory by creating a scale and by seeking evidence for or against the theory.

### *Carnism Scale*

Interview questions nine to eleven, fifteen and sixteen as well as short answer questions numbers two and three were used to construct a carnism ideology scale. Each participant received a point for mentioning meat in either interview questions nine or ten. If the participant indicated that they would not convince the child in question eleven they got zero points. A “no” answer for question fifteen or a “yes” answer to short answers two and three received an additional point for each. There was a chance to get two points for question number sixteen if they chose to answer both categories would bother them, or if fruits and vegetables would bother them more, but only one point for answering meat for any reason other than the life of the animal, and zero points if they chose meat and said something about the life of the animal. While choosing to eat meat could have been another

additional point on the scale, this was excluded because there was no variation among all participants since none abstain from eating meat.

### *Carnism Concepts*

Passages from the interview data were coded using theoretical concepts that Joy outlines as the basis for human social conditioning about animals. Confirmations of and inconsistencies with the theory among these participants were sought. First, codes were attached to any indication of the invisibility of the system and more importantly psychic numbing tactics that arise from knowing the harm or death that comes to animals. Second, codes were assigned when interviewees indicated that this system would be minimized, denied, rationalized as well as routinized. Third, the appearance of the “cognitive trio”, as Joy calls it, when speaking of animals; objectification, deindividualization and dichotomization, that generally allows people to relate to animals used for food as things rather than beings with distinct personalities, and emotional lives, was noted. Finally, dissociation and avoidance tactics employed during the interviews were coded as such.

### *Meat Eating Justifications*

Justifications for eating meat were coded using descriptions provided by Piazza et al. (2015) and can be found in Appendix C. These were found in interview question number fourteen. Justifications were mentioned in discussions of other questions, but those justifications were not added to this measure. Since the question was phrased as a generalization to people the participants could have answered either about themselves or about others. If they indicated that others in their culture have other reasons they do not, then that was still included. This was noted for understanding them as stakeholders and how the purposive sample can differ from the culture they are a part of or how they perceive their culture.

The concept of the “nice” justification was deepened by this study to include appeals that involve: status, diet variety, ease of cooking or meal planning, convenience, and meat as a unique food. These can all be considered as provoking a nice feeling of being satisfied or fulfilled. In ER, the miscellaneous category was coded for responses that stated meat was, “hard to avoid” and “always there” which can be interpreted as abundance which also occurred in OR along with other reasons like marketing, peak cheapness, and identity. The justification of “identity” may belong in the category of “normal”, but rather than being similar to the justification of someone saying they were “raised on meat”, it was coded as uniquely different.

## Content Analysis

### *Recent Laws*

The law from Oregon is Senate Bill 263 (SB 263) from 2015 that amends Oregon Revised Statutes chapter 459A known as the Opportunity to Recycle Act. From Emilia Romagna is Regional Law 16 (RL 16) from October 5, 2015 known as Provisions to Support the Circular Economy. Text of the laws were searched for; food waste, goals of the law related to the environment or any others, whether the waste hierarchy model is referenced, waste targets and assessments. RL 16 was translated via the web add-on of Google Translate.

### Bias

Two participants asked about the inclusion of fish on the short answer instrument. One person from each region were told that they could include fish in their weekly meat consumption. Given this, the comparative on this matter would not be affected. The justification for that is if they brought it up, then they may think about fish in this way, and from a theoretical perspective fish as animals are generally dichotomized into the edible and non-edible categories that follow carnism assumptions.

Biased results may come from the small sample size (N=25), the type of sample, and from the researcher. Participants were self-selected in this research and as such may have underlying characteristics and beliefs that differ from the population of food waste stakeholders in Oregon and Emilia Romagna. The researcher has knowledge and experience with food issues and is both an insider and an outsider to certain elements of this study. She has a Bachelor's of Science in Nutrition and is nationally certified as a Registered Dietitian Nutritionist (RDN). RDN's are trained in political, social and biological aspects of human nutrition. She has spent half her life in Oregon, and the other half in other states in all regions of the US in addition to eight months living in Eastern Europe (Slovakia). Recent graduate courses focused on food systems. She believes in equal rights for all including animals, and has been vegan since 2010, for ethical, environmental, and health reasons.

## Analysis

### Participant Description

The 25 people that chose to be involved with this study represent a diverse set of responsibilities along the food supply chain and in the policy subsystem. These participants come from industries such as food production, waste management and recycling, environmental quality management, edible food collection and donations, research, and from legislative bodies. The full list of organizations and position descriptions can be found in Appendix D.

Tables 4 and 5 describe aggregate characteristics of respondents in both research locations. The average age was about the same between the two regions as well as their meat consumption and gender distribution. Their average incomes are very different when compared across regions, but are both about 200% of the median incomes for the respective regions. Of the nine stakeholders in Emilia Romagna that chose to answer the question of race or ethnicity, they responded as either white, Caucasian or Italian, while all fourteen in Oregon answered white. In ER, this is not a common

demographic question to ask. These participants mostly perceive that food and agriculture as it relates to climate change have the same or more importance than other sectors that contribute to greenhouse gasses. Three of the Oregon group were the only ones who answered that this subject was less important.

These participants' meat consumption when compared to statistics from Table 1 show that they consume less meat on average than Italians and less than the people from the US and Oregon. Those from ER eat only 58% as much meat as Italians in general, while participants from OR eat about 70% as much meat as the rest of the people in the OR. These participants' perceptions of their own and others consumptive behaviors as an average reflect these findings as well. Only one person in ER disagreed that others in the region ate an excessive amount of meat, but they all agreed that regionally, people there eat a lot of meat. In OR, only 69% of the respondents agreed with this question, and 63% said others in the region ate an excess of meat. For thoughts on themselves, basically the results flip, that they believe they do not eat a lot and that they do not consume an excessive amount.

Curiously, a few inconsistencies showed up in the disaggregated data among both groups. In ER, the top three participants with the highest reported meat consumption said that they did not eat a lot and it was not excessive, while they answered that others ate a lot and two said that people in the region ate an excessive amount. Their intakes were 200, 200, and 144g/day (above the average for the area). One of the two people in ER that said that they ate an excessive amount reported their intake as well, and it was on the lower end of the range for these participants at 70g/day. This also occurred in Oregon with two of the three highest consumers saying that they do not eat a lot and it either may be or was not excessive consumption. Their intakes were 142, 114, and 113g/day (above the average for Oregon). The person with the highest consumption acknowledged that they ate a lot along with reporting that others do as well. The participant with the second highest consumption in OR said that people in their region do not eat a lot and they do not eat excessive amounts of meat.

Some differences between the two groups of participants can be seen here in Tables 4 and 5. As a fraction of their income, on average the participants from ER spent about twice as much as those in OR on food purchases each week. About two thirds of the people from ER identified with having a religion as opposed to only about one third of the people from OR. In ER, participants that did not respond with a religion are those that answered none or atheist, but in OR that answer included Unitarian for one participant. Unitarians may identify with any religion or none. The largest category of participants in ER is from the expert or scientist group whereas in OR that was the public administrator category. If these are condensed to represent government at any level, and nongovernmental workers, then the majority in OR would be employed in government jobs at 64% and the opposite is true for ER where 64% are nongovernmental workers.

Table 4. Participant age, meat consumption, household income, and income for food				
	Average		Range	
Variable	Emilia Romagna	Oregon	Emilia Romagna	Oregon
Age	43	46	35-49	33-65
Meat <sup>1</sup> g/day consumption	70	70	4-1400	113-992
HH Income <sup>2</sup>	€ 58,444	\$ 103,364	€ 30,000-120,000	\$ 60,000-175,000
Income for food <sup>3</sup>	15%	7%	3-52%	3-14%
Notes: 1. Ounces reported in OR were converted to grams using (1oz=28.35g) and all were averaged to a per week frequency and rounded to the nearest gram. 2. Median household income not including imputed rents 2014 in ER was €27,911; Median household income in OR 2015 \$51,243 (ISTAT, 2017; US Census Bureau, 2015). 3. Only 14 participants answered the amount they spent on food purchases per week				



Table 5. Participant gender, religion and category				
	Count		Fraction	
Variable	Emilia Romagna	Oregon	Emilia Romagna	Oregon
Female <sup>1</sup>	4/11	7/14	36%	50%
Religion <sup>2</sup>	7/11	4/14	63%	29%
Policy Maker	2/11	1/14	18%	7%
Public Administrator	2/11	8/14	18%	57%
Expert or Scientist	7/11	5/14	64%	36%
Notes: 1. All others reported their gender as male 2. Religion is anyone who identified as having a religion. In ER that is Catholic; in OR that is Christian or Catholic.				

The analysis is structured by thematically addressing the interviews. It begins with the theoretical lens applied to stakeholders' responses laying the groundwork to understand how carnism is manifested with these participants in these two regions. Next, a background of how participants understand the issue of food waste is detailed. The analysis then moves on to uncover the logic flow of the research questions by considering participant knowledge and beliefs about what foods are most impactful in relation to climate change, and if they think the government should act to reduce consumption of those foods, as well as how the participants would feel if they were told to change their own diets to reduce their carbon footprints. Following that, the link between upstream GHG production and the food waste policy environment is investigated. The next to last section of the analysis covers participants thoughts on why food waste is a problem. Bringing the pieces of the analysis together with a particular focus on participant carnist beliefs, a detailed look into stakeholder intentions on targeting meat in food waste policies is elucidated in the final section of this analysis.

### Carnist Ideology and the Value of Meat

Carnist ideology is embedded in first developing the list of interview questions, because the interview guide needed to use the lexicon of carnism. Leading up to the last section, questions were ambiguous asking questions using words such as "food" and "diet" to allow the participants to define to

the interviewer what food means to them and what a diet includes. Although defining what animals were considered food did not take place, the baseline among all of these stakeholders at this time in their lives, was that some animals are food to them. This fact was socially constructed for them at a very young age, or for a few participants they had returned to eating meat for medical reasons, or by rationalizing what was more important to them.

In the last section, “Meat Questions” the title here is appropriate for this population rather than calling the section, “Questions About Animals Killed for Food” which would be more fitting for those that have vegetarian belief systems. The implication in question twelve in this section was phrased as these people do eat meat, and that was not challenged by any of them. For example, “Do you think meat is cheap for what you get from it?” would have an answer from a vegetarian that they don’t get anything from it, but no participant in this study rejected the premise imposed in this question.

The level of carnist ideology developed in the scale ranges from zero to the maximum of eight points. Based on the seven questions used for the scale, on average the participants in Oregon scored a 2.7 with a range of zero to six, while those in Emilia Romagna scoring a 3.6 with a range of two to six. Despite reducing these responses down to create a scale, this was not all that was gleaned from these questions. For instance, on question number nine, for the Emiliano Romangnoli it was pasta of some kind that they indicated were part of their traditions or celebrations. Usually this dish was made with meat as an ingredient either in the sauce or inside the pasta, most often this meant tortellini.

*“Surly pasta and meat. Pasta and all the varieties that all the Italian men and woman can make. Here is tortellini and lasagna, tagliatelle. These are the ones we are known all over the world for.” – Giovanni, ER*

One Oregonian shared this sentiment, mentioning her Italian ancestry, responding with scapel soup which she described as crepes in poultry broth. Along with this person, there was another participant of Italian descent, and they both mentioned a Seven Fishes tradition. Two people that

mentioned German influence either with ancestry or with marriage were on both sides of the fence, one saying goulash as a traditional meal, and the other mentioning sausages. For the other Americans, it was mostly naming turkey or ham and then sometimes listing some of the accompaniments, while only one participant named meat in the past tense and that it isn't a major focus of these celebrations with her own nuclear family.

*"Probably the standard turkey for Thanksgiving maybe a ham for Christmas, potatoes, bread products, rolls, and cranberries, right?" –Stan, OR*

This comparison creates a very different visual among the two groups as people reconstruct and tell the story of their memories of how holidays look and how the meal looks on the table, on the plate or in the bowl. In general, the traditions of the participants from OR, meat is something that resembles the animal from which it comes from, is central and overtly visible among the foods that they named as critical, but for the ER participants, meat could be hidden in the pasta in some way, or chopped into small pieces in a sauce. The actual amount of meat eaten at those celebrations might be less due to the style of meals in ER, or if separated out from the dish, it could be the same amount. This invisibility of the meat as an animal when presented for consumption, Joy constructs as the mechanisms of the carnist belief system; avoidance and dissociation, and can be seen as more prevalent in the tradition of Emiliano Romagnoli (2010). These are mechanisms of what Joy calls "psychic numbing" in which people disconnect mentally and emotionally from their experiences.

For one Oregonian who chose to share her thoughts about chickens, this concept breaks down a bit when she recognized her incongruent values and behaviors in response to the question of a food that she would miss the most. She settled on mangoes, but spoke of her love for chicken. This passage operationalizes psychic numbing as a continuum rather than a dichotomy of good and bad characteristics. As the theory is presented, a farm animal is thought of by carnists as dirty and stupid.

*"If it came to a meat, I would really miss chicken, because we eat a lot of chicken. It's so funny because I love the animal chicken. I think they are cute and wonderful and I was telling my husband the other day I was saying, 'It's so bizarre that I just love this animal and I really love to eat it at the same time.' It just seems so wrong, it just does. Chickens are so cute and sweet and funny and then I'm eating it. It's just kind of bizarre."* –Jennifer, OR

Describing a chicken with characteristics that are humanizing may mean that she views all food animals this way. It could also mean that those chickens she interacts with are special because she has been able to experience ones that have been nurtured in an enriching environment similar to companion animals' environments who have activities and comfortable homes. This means that there is a degree range within carnist belief systems, and eventually one reaches a point where the recognition of the animal as an individual who fits into the dichotomized schema on the positive side of smart vs. dumb or clean vs. dirty becomes the bias toward animals used for food.

The most cherished celebrations of the holidays or other important life events, with their particular ingredients can be very resistant to modification. This could be due to outright objection and social conditioning from older family members like Willie's. When asked about any changes that have occurred in the last generation, he stated in a lighthearted way that even the very suggestion of changing the meal for Christmas would warrant the threat of death from his mother. Changes can also be resisted because the familiarity brings about stability and satisfaction.

*"These are meals that do not change very much from year to year and that's kind of the beauty of them. I might throw in a different dish every now and then just to kind of mix it up, but kind of the core components of the meal really don't change much."* –Tara, OR

*"Fortunately, my mother is still alive, and I know that if I will visit her, I will find the food of my childhood, traditional dishes, and I am going to feel satisfied."* –Giorgio, ER (translated)

Despite being resistant to change, parts of traditions can be notably different from someone's childhood to their mid-age. During their interviews, though, very few noted changes to these traditional foods and meals like tortellini now being bought from the grocery store rather than being homemade or now having healthier, more local foods and less wasting than in their youth. Some from each region said

that they personally or others in general were eating less meat. Suggesting in a few interviews that eating less meat was generally linked to health concerns and recent public health campaigns. Also, maybe in a lesser way cutting back was related to concerns for the environment.

Traditional celebrations aren't the way the vast majority of people in these regions eat every day, but the celebrations have great meaning to people, and do create certain attachments and feeling towards food. Constancy and familiarity through memories and traditions appeared again as in question nine, when stakeholders were asked about a food that they would miss the most. In question 10, those feelings presented themselves in basically two ways, both deriving from pleasurable experiences.

When comparing answers cross culturally, the majority of people answered that they would miss these foods because of enjoyment through the qualities of the food. This was more prevalent in the stakeholders from Oregon. These answers were coded as mostly taste, but also texture and variety. Only two participants in ER mentioned the nutritional content of the food. Surprisingly, looking at a cultural perspective it would be expected that more people would name meat, and especially in Oregon. Only one person from OR named a meat as a food they would miss which was bacon, for its taste. There were four in ER who named meat, but the reason they would miss it was evenly split between taste and memories or tradition. Food in general has emotional value to these participants, but they also surmised about the value of meat and where that comes from. Participants said perhaps these beliefs and injected values have left a lasting interpretation of what meat represents in these cultures.

*"This tradition is linked to peasant past when killing the pig was a cause for celebration, and producing all the products from it. In the celebration, you eat the most valuable things, and meat is perceived to be the most valuable things." --Anna, ER (translated)*

*"I know that it used to be more of a special occasion food, but it has become such a daily food. So I have theorized about that; where it makes us feel of a higher status maybe to indulge in meat." --Stan, OR*

The perceptions about the value of eating meat shared in these conversations indicate that celebrations are not truly proper celebrations or even considered celebrations at all if meat is not involved. It can also be understood from these interviews that meat eating represents a status symbol, an entrenched ideology as nearly half of them in both regions have never questioned the practice of eating meat, and that it is woven into understandings of identity.

*“For us is typical dishes is connected to social way to stay with other people, when you want a party; connecting. First you think, you can do a BBQ, so meat. You don't think about a big vegetable dinner party.”* –Matteo, ER

Matteo continued in the next question to explain how World War II had an effect on more recent valuations of meat. This sentiment was also supported by another participant from ER as well.

*“...in our region is my parents and grandparents they went out from the second world war, so eat meat means entering a better life. After the war, could eat meat could mean eating quality food... is the general in economics and political, this is the history of the food. When we came rich day by day usually you pass from a vegetarian diet to a meat diet. It is very interesting to analyze how much change in the last few years, because 30-40 years ago, the important was having meat at meals as a way to exit the poverty of the war.”* –Matteo, ER

Two things can be understood from this passage. The value of meat was it being seen as a quality food. The other thing is that in his biased understanding, going from a vegetarian diet to a meat diet is purely based on economics, not ethics or beliefs underlying those ways of eating. There was truth to that understanding of meat adding quality to a diet during those lean times where there were not enough calories. Meat as a calorically dense food is valuable in the context of food scarcity. For those people wasting food in ER and OR, abundance has become the problem. Despite the shift in availability and access for many people, the belief in the quality and value of meat has persisted among people in these cultures.

## Confirmation Bias

Carnism theory predicts that there will be cognitive distortions such as Giovanni's responses to why he or others eat meat and if he has ever questioned it, as well as an earlier comment while answering question that asked respondents, "Would you consider beans, peas and lentils cheap for what you get from them? What do you get from them? (Cultural, biological or any other)."

**Giovanni:** *"So when I was a child, the doctor said, 'You are not so healthy, so eat meat,' but I really don't know if he was right first of all, and I still don't know if my children are ill or not, so I should give them beans or lentils or meat and so on. I admit my ignorance on this...I don't know if there is a sort of general perception that I think that there is a social influence that the meat give you strength as my doctor when I was a child."*

**AR:** Have you ever questioned eating meat?

**Giovanni:** *"No, the answer is no. It's part of my tradition and a problem to avoid it completely."*

**AR:** Even with your vegan friends [learned from previous answer], have you had any influence from them?

**Giovanni:** *"No, even with them we talk about it a lot of times. They are vegan for respect and for the animals. You know the term, for the respect and humans have no right to eat them. And she is a doctor and is very aware and knows that for humans it's not necessary, and in fact, even better for avoiding meat completely. But they never convinced me completely."*

This is evidence of confirmation bias, which can apply for any belief that a person has. It means that one will agree with information that conforms to one's beliefs, and will most likely not form new beliefs. This exchange illustrates the concept, since the participant eats meat, he accepts one doctor's information over another when it fits with his belief that eating meat is okay, and even imbued with special strength-inducing characteristics. The confirmation bias in this example is weak, given the wide spread evidence elsewhere of confirmation of bias. It could be the case that the higher level of topic specific knowledge obtained by Giovanni, like others in the sample, allows him to have a more nuanced bias. It is important to recall that there is likely a continuum of strength of carnism beliefs, and these are likely related to confirmation bias in this case. The observation remains that when presented with new ideas by friends, they do not supplant his current ideas.

Unpredictably, more of these participants have questioned the practice of eating meat in both regions at 55% and 57% for ER and OR respectively. Given that this belief system is described as entrenched and invisible, it was expected that the majority of respondents would have not questioned the practice of eating meat. Because this group is a purposive sample of those that are most likely knowledgeable about food issues, this is not a shocking finding, but is important since it would mean that this ideology might be too weak to have direct effect on decision making. Professional learning or socialization, as well as the elevated income of these participants compared the population that they represent could be correlated to weak carnist beliefs. The reasons given for why these participants eat meat, despite the likelihood to question it may also be contrary to the order of categories that have been shown in the literature.

### Meat Eating Justifications

The reasons that people give for eating meat function to legitimize their worldviews and serve as rationalizations for their beliefs. Overall, these participants not only differ from what is expected about questioning the practice of eating meat, they also differ from Piazza et al.'s (2015) findings about people's justifications for eating meat. In response to the question of why they, or people in general eat meat, the participants did not offer any justifications in the two categories of religion, or sustainable/humane slaughter.

Figures 9a and 9b show that these participants differ in their beliefs from the populations studied previously, as the top two and bottom two of the 4Ns of justifications are reversed. Recall that Piazza et al. (2015) found the following: necessary (42%), natural (23%), nice (16%), normal (10%). Their conclusion about these justifications and motivations suggests that invoking the 4Ns all have the same meaning, i.e. a person has carnist beliefs or not. This study shows that which justifications that are used



matter, and may be dependent on other correlated variables, like beliefs, concern for the environment, education level, or region where they live, to name a few.

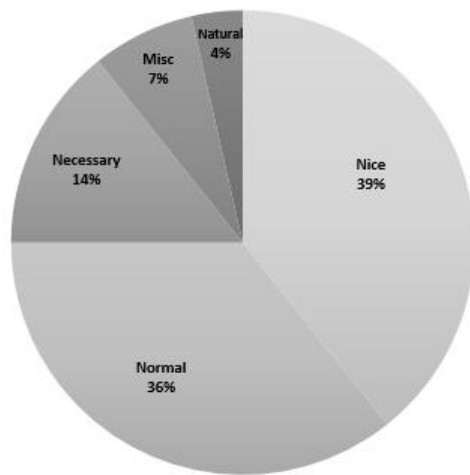


Figure 9. a. Meat eating justifications Emilia Romagna

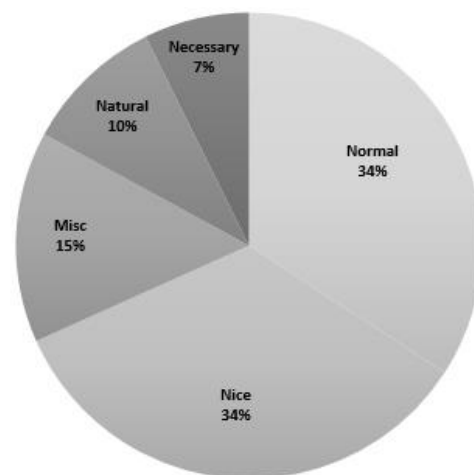


Figure 9. b. Meat eating justifications Oregon

It may be important in future research to link these variables and meat eating to differentiate between which justifications are used, not just that they are given. With these respondents, this means that eating meat is more of a socially influenced behavior rather than being seen as a function of biological needs or laws of nature. Again, this can be interpreted as lessening the entrenched nature of carnism which would have an effect on their intended actions.

### Conforming to and Reproducing the Carnist System

*"I'd be the first person to admit that probably that [sic] the reason I eat meat because that's what my parents served me. I'm guessing that if I were raised as vegetarian I would probably not miss meat."* – Elaine, OR

Just like Elaine, seven other Oregon stakeholders commented like this, that people eat meat because it is something that most people are raised to do and that growing up, it was the default that parents gave kids meat to eat. Before children can talk and understand the world in many other ways, they have been conditioned daily, multiple times each day from their families or guardians how to act in society concerning their foodways. People learn from very early on about the socially constructed

realities presented to them which they then internalize and form heuristics and biases about food and animals as food. For the ER stakeholders, the four that used the term tradition or said that it is the culture could be interpreted to mean that there is a longer history, or that there is a more homogenous culture in that region for those choosing to eat meat. This would mean that carnist beliefs would be more entrenched in Emilia Romagna. Because these participants were raised to eat meat, they could logically choose to persuade the next generation to eat this way as well, even if the children were objecting.

Contrary to what was predicted, only about one third of all the participants would choose to convince a child to eat meat if they didn't like it. The answers from these respondents were messages about health, growth and protein, but even among those that elected not to convince this hypothetical child, they still would be concerned about these matters as well. Most likely, children are unaware of where food comes from until much later in life, so it would be out of the norm for them to object to eating meat if they had routinely been fed this food and grown accustomed to it. The same can be said of other practices that go into creating this food. Again, the invisibility of the system gets reproduced in children because they can be distanced from the process to the point that they do not know that animals are turned into food.

*"In my experience, though, small children are protein fiends. So our child, one of the first things that he would eat a lot of was chicken and then eggs, beans; protein, he just shoveled it in. But no, I wouldn't [convince him to eat meat] and we have had, or we had the beginning of the conversation about meat being animals. He's two and a half. His mind is being blown right now." –Laurel, OR*

If they are introduced to the process at a young age, it may be done in specific ways. Joy writes that objectification and routinization are mechanisms of psychic numbing that allow people to feel okay with the practice of eating meat, and particularly the killing and dismemberment of animals. Gianluca from ER said that working for eight years in a slaughterhouse is the reason he does not question eating

meat. Matteo and Mark recall fond memories of killing pigs or raising cattle with their grandfathers when they were young.

Russell from OR chose to share how a practice in his youth allows him to unquestioningly accept eating animals now, and even animals that he is not assured are treated humanely. The different ways that the animal is objectified is in the language where a body becomes a carcass and intermuscular fat is marbling. Enlisting youth each year with positive reinforcement in the environment of a contest, allows them to properly become a part of a society that eats meat through being a part of a routinized way that animals become food.

**AR:** *Have you ever personally sat there and been like, "What am I doing? Why am I eating this? Or has that never crossed your mind?"*

**Russell:** *"It hasn't really, because I've seen it through the process. When I was in fifth grade, maybe sixth grade I started doing the carcass contest. That's where we would buy a calf in the fall, weigh it and then bring it back in the spring, and they would slaughter it. And we would go to the slaughter house and see it hanging on the hooks and they would grade it and we would get points based on how much weight our calves gained per day; the marbling; the grade of the meat and a whole bunch of different factors went into the grading. And so I got to learn about the process and how it was done. So I know how that animal was handled all through that time period. So we raise our chickens and ducks, and I know what their accommodations are and how we handle them. And so it's interesting, I don't think about that stuff when we go to a fast food restaurant or something like that but I have this other background of information that I have in my head that's a positive experience."*

Carnism manifests itself in these structured ways but also in less institutionalized ways through casual social interactions in much the same way across cultures that eat meat. Some participants shared how the pressure to conform to eating meat still comes from parents, or peers as they engage with this practice mostly in the company of others. They even shared how social pressure was relieved when they chose to eat meat again after abstaining. Meat eating is more than just obtaining nutrients, it means social inclusion and group cohesion.

## Carnist Identity: Personal and Regional

This next quotation from Anna shows a nuanced difference in how to understand conformation to social norms. Hers is a reluctant conformation with a meat eating justification, as opposed to passive conformation that would be coded in the category of “normal” as seen in the categorization of reasons for eating meat in the section above. These interviewees chose to emphasize the region or nation as well, a characteristic of other ER and OR interviews.

*“I’m not vegetarian, but I don’t eat meat very much. It’s not so easy in Emilia Romagna don’t eat salami and those.”* –Anna, ER

*“You know that Italian people are very linked to their food and food traditions. The example of my use of meat, if I’m not vegetarian and not vegan I use meat in a way that my parents look at me and say, ‘Why are you not eating meat?’ and I say, ‘No, be quiet, I eat meat sometimes!’ I repeat I am not vegetarian, so sometimes I eat.”* –Giovanni, ER

One participant articulated very well how he viewed these two cultures as different. He expresses that for Italians, it is very important to come from and be familiar with a place.

*“Here in Italy, we remained partly in the medieval world, meaning that there is still a territorial fragmentation that, I think, does not exist in the United States of America. We are very used to be born, to live in our territory, in our land, and we know very well our territory. We live sometimes even in a symbiotic bond with our territory. I suppose Americans have no difficulty in relocating. As for us, relocating is a drama. At European level, Italy is also the nation with the highest percent of people who have a house of their own property. Also in business, the most important contracts are signed during a meal, not in an office.”* --Giorgio, ER (translated)

While it is likely true about some Americans not being fervently tied to any particular state in the US, there are particular images and legacies that are derived from the history of these states and define who these people are. Both groups of stakeholders shared how meat and the regions in question were tied together. In the Western US, “the west” evokes images of cowboys and ranchers. Eating meat is heavily tied to the identity of people living in the west in general but also specifically for Oregonians that are proud of their ranching heritage. Not eating meat was also suggested by Thomas, as having a

specific image that some people may want to avoid, that of “leftist progressive” and “hippie liberal”. For the participants in Emilia Romagna, many of them spoke about differences in food culture that are unique compared to other regions in Italy. Those that come from other regions and from ER, stated that the region is known for being very tied to meat, but more so from pigs than cattle. A few said that going just 50km away, the traditional meals and the economies are no longer based on meat foods.

### Carnist Identity: Organizational

Identity is important on an individual, and regional level, but also for an organization. Myriam, as an employee of the company, Granarolo S.p.A., was the only participant from the food production sector. She was not from one that produces meat, but one that produces dairy products. In the last two years, plant-based milks and yogurts have been added to their production line. Therefore, her expression of carnism may be lessened as the system surrounding dairy consumption is arguably less violent than meat productions. Their organizational understanding of waste is about shelf life of mainly fresh products. Wastage can happen due to two main causes, (1) transportation i.e. accessing farms, transporting milk from farms to processing plants, and then to retail sites, and (2) consumer needs, ex. where a liter of milk may not be consumed before it goes bad in a single person household. Wastage can happen with fresh plant-based or dairy products.

In their production arm with farmers, they are working to reduce output of GHG emissions, but Myriam also says that the carbon footprint should be printed on all products’ packaging and made aware to consumers. It is interesting to note that in their 2015 company sustainability report, Granarolo’s shift to producing plant-based products like milks and cheeses from soy and rice was not mentioned in the section on emissions, but only in the section about financials focusing on the market share that they now have command over (Addeo et. al, 2015, p. 61- 148). As a representative of the company though, Myriam understands the link between their animals and climate change. She said:

**Myriam:** *"It means from 2000 [to 2017] we have a reduction [in demand of milk in Italy] of 50% okay, so it's a lot. We have to change our mind and change our company and we introduce also alternative to the milk. I mean, soya drink or rice drink and so on, produced by our farmers."*

**AR:** *Is that for climate change?*

**Myriam:** *"Yes, as you know you have cows, you have a lot of problem in terms of climate change."*

The company had completed LCAs for their regular and organic varieties of soymilk in 2015. These reports show that emissions from soymilk were 0.96 kg CO<sub>2</sub> eq/liter and pasteurized milk was over 1.5 times more than that, at 1.6 kg CO<sub>2</sub> eq/liter. On--farm production accounts for 87% of emissions, rather than packaging, processing and distribution (EPD, 2017). Since introducing plant milks was a reactionary move to capture back the market from those shifting their diets away from drinking milk in Italy, the company may not realize the potential for emissions savings and have not analyzed the comparison of their products in terms of their environmental sustainability goals. This behavior may be explained if carnism is expanded to all animal products, not just meat. The theoretical explanation would be that targeting cow's milk by using emissions comparisons to plant milk may not be apparent or would be purposefully avoided due to a positive bias of cow's milk. The environmental product declarations are used to be transparent to the public, but may not be used in this instance for management decisions. The plant milk products were also new in 2015, the same year that this report was compiled, so in the upcoming reports in the future, they might include this comparison.

Carnism theory would predict that the carbon footprint reports would be ignored or minimized. The mechanism by which that happens again could be that their identity as an organization is tied to these animals. The company has been around since 1957, and was born out of milk productions. They have diversified their product line to include Parma ham, and the milk and yogurt that is 100% vegetable based, but cow milk and cheese is their legacy. Myriam says that the farmers identify themselves as dairy farmers, not soy or rice farmers and that moving forward in this way would be hard and it would take "...a change of mind."

## The Comparative Value of Meat

Identity and positive experiences are more than just nutrients that are gained in the consumption of meat. It could be that foods that provide similar nutrients are perceived in the same way, but it is more likely that meat is considered a special food. Questions twelve and thirteen sought to compare meat and pulses by asking, “(12) Do you think meat is cheap for what you get from it? What do you get from it? (Cultural, biological or any other) (13) Would you consider beans, peas and lentils cheap for what you get from them? What do you get from them? (Cultural, biological or any other).” Pulses, such as beans, peas and lentils, provide much more than just protein. They are rich sources of complex carbohydrates, iron, calcium and protein; though they are lacking the proper amounts of all essential amino acids in the protein that they have. This deficit is generally overcome in diets that are varied by including grains and nuts in the same day and those that provide enough calories for the person’s size and activity level. The stakeholders reported what they get from these foods in the context of whether they are considered cheap or not.

Meat was talked about being cheap in a good way when people said it provided good nutrients or they had purchased local meat that was of high quality. The reasons given for why it was not cheap was that the nutrients in meat could be sourced from other food, or just when it was considered food in general. From a negative perspective externalities associated with resource use or environmental damage were mentioned in Oregon causing meat to be viewed as too cheap.

In ER, generally people viewed meat as not cheap whether they viewed it positively (locally sourced or important culturally) or in comparison to other food. Two ER stakeholders did say that meat was cheap based on nutrients or for taste. Two people in ER stated that all food was cheap. When it came to pulses, everyone among both the regions agreed they were cheap for the nutrients and protein they gave, but in ER there were about half as many mentions of what people get from these foods when

compared to OR. In Oregon, some even mentioned them being comforting as well. These participants understand there are many ways to value meat not just from an economic standpoint, and that at least in the Oregon context that meat should be priced to internalize the negative costs that it is inducing in terms of resource use.

These interviewees were asked comparative questions in the context of wasting and communications to others in questions sixteen and seventeen. When throwing food away that was proposed to have the same monetary value, meat in both regions was more valued than the choice of both or that of produce. The reasons that people had for this selection were that they valued it more beyond the price, but three of them couldn't place why. Overall, the value of wasted meat comes from knowing that this had once been a living animal, or that there were more resources that went into producing that food.

When no benefits will be derived from the food that will be thrown away, it is there that the life of the animal is considered. When asked in question fifteen, "Have you ever questioned why you or others around you eat meat?" only one person from each region makes mention of considering the animal's well-being or life in their decision making to consume that food. A few more did divulge that friends or family are vegetarian for ethical reasons, but that was not something that has led these people to do the same as their loved ones, but it may be a motivator for them to not waste meat.

In Oregon, the difference in suggesting that the animal's life is of value when wasting the food rather than questioning the eating of it, was a split of eight to one. While this question did not ask them to explain any further than a yes or no, nine people chose to do so. This is another example of how these stakeholders' values and beliefs are incongruent, through a mechanism of avoidance. If they value the life of the animal, they also would not take the life of the animal, or at least when telling of why they questioned this practice that the value of the life of animals would be considered and communicated.



Carnism theory would explain that if it is stressful to value a life and also be responsible for ending it, a person would use an avoidance coping mechanism. The theory predicts this inconsistency and coping strategy. If benefits are derived by the oppressor, this oppressor will deny or avoid coming to terms with this incongruence between values and beliefs. This may happen through not thinking about the animal's life, or it may happen by not voicing this to others even though they have thought about it.

In Emilia Romagna, nearly all of these stakeholders would have no problem in communicating professionally about research that indicated people should eat less meat. Three people said that they already do this. Their feelings about having personal conversations about this mirrored their first answer. One person said that they would need more evidence professionally, but a personal conversation would be easier. The other person in that region that said that they would not feel good about professionally telling people to eat less meat, said that they would also not tell people personally, but only model this behavior.

In Oregon, the results of the first two parts of this question indicated that this is not a subject to consider lightly. Multiple stakeholders mentioned that even in professional facts-based communications that this is more of a personal choice to not eat meat, or to eat less. The emphasis again was that information sharing is fine but telling is not okay. For a food service organization, in fact, having meatless meals can be "threatening." Personal interactions for three people would be perceived as being, "weird," "worse," or "harder" than professional conversations. One said they wouldn't discuss this on a personal level and two more said they would only go so far as to show others how they may eat less meat.

The final question of the interview (17. b.) was problematic for participants in ER and OR. It was difficult for them to imagine the scenario where meat and other plant foods had the same negative impacts. Nearly everyone struggled or was unable to imagine the fictitious food that has the same

negative impacts as meat, both for health or for the environment. The question was stated, often clarified, and still further explained if it did not seem that the underlying query of value was coming across.

This question may have been difficult, but even the difficulty of it is telling because the participants have biases that are so embedded in them about certain types of food that it is problematic to even venture to answer a hypothetical question that goes against what they know. The bias was opposite in what this study was exploring in that overall meat foods would have positive heuristics.

As people that are knowledgeable about food system issues, and being primed through the interview to think about meat and the emissions associated with it, it was a struggle to frame the question. In the end, it was evenly split between having the same feelings about communications on a harmful fictitious plant food, and meat foods being a harder conversation due to this being a culturally important food. With this result, it is difficult to conclude whether it is meat or whether it is food generally that is sensitive to discuss.

## Background Understanding of Food Waste

Preventing wasted food is key for all these stakeholders, and the food waste hierarchy is well known to both regions. This understanding of the top priority of prevention of waste is also supported and codified in both regions' recent laws, Senate Bill 263 from 2015 (SB 263) and Regional Law No. 16 of October 2015 (RL 16). Although, one person from Oregon stated that food donations are not a solution to waste given that this food is not balanced nutritionally which would go against the second level in the hierarchy. They felt that consumers need to value food more. Value can come through knowing all the upstream environmental impacts including GHG emissions from productions of food. In conversations, this was talked about as a new coming paradigm, where previous work has been downstream and waste management rather than a full life cycle approach to waste.

Only a few participants mentioned having to create awareness about the social impact of wasted food and hunger. This may be due to it being known and accepted, but could be because they do not think that it would be that motivating. This was not discerned in question one. These interviewees indicated that not only was awareness a need among the public, but skills training, and economic incentives. The positive incentives would be by showing cost savings of not wasting or negative through “pay as you throw” fees instituted by a municipal waste collection organization.

Donations and collecting food from households for waste to energy facilities or compost needs to be as easy as possible for people to get maximum participation. Even if programs like these are easy, some participants pointed out that a lot of elements go into the fact that the food got wasted which may be outside of the influence of food waste and recycling organizations. The examples given one from each region were that the profit margins can be very high when stores have very full shelves, i.e. marketing techniques that get people to buy lots of food, or date labels being confusing. Most importantly, any program or policy that is created needs to be tailored to the local context and sector that it addresses.

A few unique concepts arose out of conversations with Oregon stakeholders. The idea of educating consumers through food waste channels about the differential environmental impacts of food type was seen as the next step that they should be taking. Another participant said Latinos that they worked with have different values than non-Latino populations and communications need to be directed to those values to motivate that population, but again this could fit in with the overarching idea that policies and programs need to specifically target the population that they serve.

### Most Impactful Foods

*“There may be no other single human activity that has a bigger impact on the planet than the raising of livestock.” --Silvia, ER*

All but one participant answered that animal products are more impactful to the environment or contribute more to GHG production, with specifically identifying meat of any kind as an answer for seven of eleven participants in ER and thirteen of fourteen in OR. The participant in OR did mention meat later in the interview. Table 6 represents the various foods that were stated when answering this question. All of them stated animal source foods in answering this question. These participants do attribute negative environmental impacts or more GHG production to animals and more importantly nearly all recognize meat's impact. If they had not, then that would offer one explanation to the even-handed treatment of all foods in the food waste policy subsystem.

Table 6. Counts of types of food mentioned and participant region		
Food	ER	OR
Meat	5	10
Meat –beef	2	4
Meat –other	1	-
Dairy	1	7
Eggs	-	1
Animal products	4	2
High mileage	2	3
Processed	1	2

### Public Encouragement on Impactful Foods

Since nearly all of these people identify meat as more impactful than other foods, the next question, while originally asking about “foods” then changed to identify their positions on whether the government should take action to reduce people’s consumption of meat due to its impact. Nine of the OR participants said no or could not decide, while almost all participants in ER said yes, versus answering no or giving reasons for both yes and no to be valid (7:3). While this seems like a clear distinction between the regions, the real sentiment in their answers through the respondents’ reasons why they chose the answers they did creates a picture of similarity between the two regions on how they see the reasonable avenues with which to handle the intersection of meat consumption and climate change

through government intervention. The differing answers come from the meaning participants gave to the word “encourage” and how they understand government encouragement.

The findings from Siegrist, Visschers, and Hartmann (2015) are contradicted by the respondents’ comments about government intervention. These participants know this food is the most harmful of all foods, and largely believe that food and agriculture hold more or the same importance as other sectors that contribute to greenhouse gasses. Overall, this was 87% of respondents, with 65% answering “more” to question one of the short answer and demographics questions they were given. That being said, they were not asked to compare behaviors, only foods. These participants are a unique segment of the populations they represent, so they may agree with findings from Siegrist, Visschers and Hartmann when they write about the positive correlates to believing eating less meat is an environmentally friendly behavior; believing it is healthier and better for animal welfare. Despite these understandings of food and climate change, the results for this question may have more to do with the way these participants see the role of the government and the effects of climate change.

The term “encourage” was purposefully vague to be able to uncover how these people understood the role the government should assume. A few explicit statements were made that rules and mandates were not options at all to encourage people to eat less meat. Another few mentioned that the regulatory role of the government when it comes to food is acceptable for health and safety, but not when meat consumption and negative effects related to climate change are the concern. This implies that these stakeholders do not see climate change as an issue of safety or health, or to be more specific their own region’s safety or health.

With the nine people that stated the role of the government is to be informative, there was a pattern driven by the underlying meaning of the term encourage. In Oregon, three of five participants who said no to encouragement, thought that this term meant to tell someone what to do, and followed

up with saying that the role of the government was to educate in this area. This is slightly departing from the government role as outline by SB 263 which states in Section 5(2)(a) and (b) that governments shall fulfill program elements including “education and promotion” campaigns which targets, “residential generators of waste,” and focuses on prevention of, “one or more toxic or energy intensive materials or consumer purchasing practices,” for the environmental benefits.

In ER, informing the public was perceived as a way to encourage them, thus all four that spoke of this role agreed to encouraging people to eat less meat. One from each region did not decide what encourage meant, but resolved that if it were to mean informing, that this would then be a yes for them as well. Three others in OR accepted encouragement in the form of economic incentives. Interestingly, there were five interviewees in Emilia Romagna that did not define their type of encouragement. This difference between regions probably has more to do with political ideology rather than beliefs about food and meat foods specifically. One that was in agreement, said it was the duty of all people, and two others stated that if there is a clear problem that has a solution, it should be encouraged as this quote succinctly outlines.

*“It might be, yes. Because if you are really interested in reducing the problem you should address the real causes of this problem. So if an important part of the environmental impacts that are generated all around the world not only at the global level, but at the local level are related or linked, to meat consumption, well, if this is the goal then you should address the cause.” ---Paolo, ER*

## Stakeholder Diet and Carbon Footprint

Question six asked participants if they were told to alter the type of food they ate to reduce their carbon footprint, to describe the feelings they would have about changing their diet habits and asked what they think they would fear most about the process. The responses inform both who the stakeholders are compared to how they view others in their culture and how their knowledge and beliefs compare cross-culturally. About half of the total participants have already made this change in

the past. Three people in Oregon who have not made any changes to their diet motivated by carbon footprint, indicated that they would probably be annoyed or have negative reactions to being told what to eat or that the change would be hard due to the emotional aspects of food and it being such a highly personal choice.

Only two ER respondents expressed negative sentiments in their answers. These two had answers that aligned with responses from the previous question, in that freedom of choice is important and being told to do something is not the way to change this behavior. Despite the word usage of “told” rather than encourage, participants from ER who have not made any changes to their diets already, still had positive feelings toward the suggestion.

As the link between direct actions and emissions becomes stretched out and more hidden, it becomes increasingly difficult for stakeholders to make those mental connections, let alone those who are likely less informed on these issues. The effect strength of a change in behavior on emissions can be seen as more diluted. Taking one more step away from the link of eating and emissions, the relationship between wastage and emissions from food production was explored in interview question seven.

### Upstream Production of GHG and Food Waste

Question seven reads: “Has there ever been a time when someone has discussed the issue of carbon footprint or greenhouse gas production of food, during the planning or execution stages of food waste policies? If yes, what were the feelings involved and outcomes produced? If no, what do you think it would look like?” The answers to this question were very informative and told the story of how it is possible that meat has not been or may not be in the future the central focus of food waste, and even why food waste has not been addressed on a larger scale. Most discussions were about how this nexus had been covered in previous instances involving the stakeholders, with three central themes. A more

negative view was presented by those that were asked what they thought the conversations would look like if they were to discuss this issue.

Viewed in the most positive light, the participants in both regions described how discussing upstream productions can be used as a great motivator both for the public and for policy makers. This connection is still more of a new topic though. It is possible that there is a shift in thinking on this subject away from end of life management, but the novelty of it means that other reasons for dealing with wasted food have historically been prioritized (economic and social), or that they still are a priority (i.e. social over environmental). Also, some stakeholders viewed this linkage as not fitting in with their scope of responsibility. Some reported that they are in charge of bigger issues not just emissions so this is too narrow of a focus, that they view food waste as confined within a program for the public that does not necessarily address upstream resource use and emissions, or that it may harm the relationship with those that donate food.

Two public administrators from each region described how this is a new concept that may be recognized by the scientific community, but is new to policy makers, and possibly offensive to the public. They explain the feel of this nexus with the first talking about food waste and emissions, and the next one adding in meat and how she sees that in the cultural context comparing the US and Europe.

*“I think it would look like a little bit strange and too specific. You know we have just approved, the region, regional planning of waste management with the horizon of 2020. It has been very long path to go that plan. We also made a lifecycle assessment which is quite related, of the whole plan, so the collection system and the goals of 2020. One of the institutions that sent to the board proposed to do the LCA approach to the plan to evaluate it also. So someone looked at them in a strange way that he wanted to do this, so I think when looking at food waste that it will look stranger and stranger.” – Giovanni, ER*

*“One thing that a colleague of mine had recently sent me an article about, he's like, ‘Maybe you could think about using veggie mob [costumes used when teaching the public about food waste] to teach people about carbon impact of the foods that we choose to eat.’ And I'm like, we're not going there! But it's a really interesting thought, and he sent me this really interesting article about somewhere that was not the US, but a European country that was looking at educating people about the importance and thinking about the choices that you make every day. So, I feel like in America, it would be extremely*



*difficult to have that conversation. I think in Oregon our number one agricultural export is beef, you know, like it's such a huge part of our culture and um it has tons of economic impacts.” –Stephanie, OR*

While crop productions outperform all of the animal products in Oregon, the perception may remain among many that meat is very important if not the most important food economically. This belief can translate into actions of avoidance in addressing this issue. Five participants expressed concerns about job or economic losses. In Oregon, one person in addition to Stephanie, expressed the same thought with one other stating that is what he hears from the public. Two stakeholders in ER shared this view.

In addition to these feelings of fear of economic loss, the most damning perceptions come from those that predicted how discussions would look inside the food waste policy subsystem in regard to reducing carbon footprints through targeting meat. One Oregon participant pointed out that a cost benefit analysis may rule out policy actions on food waste and furthermore on meat because it may not stack up compared to other sectors with bigger emissions. Fixing food waste in this way, in Emilia Romagna was seen as having to fix the whole food system there, while another had the same sentiment, but that the whole culture of the region would have to change. This belief and the connection between food and climate change was echoed in Oregon too, as a participant described the feelings on this subject at a recent conference about food waste in Washington DC.

*“Someone stood up and was like what we really need to talk about is why we need, why everyone needs to switch to a vegan diet if we're going to make any real impact on climate change. And you could tell in the room that some people were very supportive, very few people, and generally, the reaction in the room was like it was a dead-end road. So, that's been my experience in a broader policy way.” –Christa, OR*

Joy states that veganism is the opposite of carnism. Eating a vegan diet means that no products that come from animals, including seafood, dairy and eggs, are consumed. Often eating this way is believed to be a very radical shift from normal diets and is seen as an undesirable change among carnists. This social construction of the shift to a vegan diet could explain an underlying bias in the

genesis of food waste programs, where stakeholders have the assumption that all people would see this as a radical or impossible change so any suggestion that may hint at reducing meat consumption would not be seen favorably.

Results from these responses would indicate that hypothesis 2. a. is not likely, but 2. c. is likely (2. If carnism is a shared ideology, then food waste mitigation strategies aimed at the wastage of meat; a. Would not be identified, and c. would be purposefully ignored). Hypothesis 2. a. is not plausible given that most stakeholders report discussions in this area and using it for motivating consumers to change their behavior, (it is still a fairly new connection between wasted food and upstream emissions). Beliefs about the value and importance of meat would make targeting this food a sensitive subject.

### The Food Waste Fight

Elaborating on their reasons to act on food waste, participants spoke of three main reasons to fight food waste. Table 7 shows counts and primacy of reasons that were given to interview question two, “Why do you think food waste is a problem?” The main reasons given were social, environmental and economic. These participants see the problems of food waste as just as much social as environmental problems when analyzed by the number of times participants mentioned these reasons.

While only two participants (2 in ER 1=social 1=environmental) emphasized either social or environmental issues being more important, not all did so while answering this question, and they were not asked to rank these problems at the time. If primacy in the listing of problems is used as a proxy for dominance in concern for food waste, then again, social issues are just as problematic as environmental issues. Therefore, the null for hypothesis 1. cannot be rejected (If a person believes that food waste is a problem because it contributes to GHG production or uses too many natural resources, then the wastage of meat would be recognized as a major category on which to focus food waste mitigation strategies).

Table 7. Problems of food waste by region				
	ER		OR	
Problem	Count	Precedence	Count	Precedence
Environmental- upstream	4	2	9	4
Environmental-downstream	5	2	3	1
Environmental-unspecified	2	1	2	1
<b>Total Environmental</b>	<b>11</b>	<b>4</b>	<b>14</b>	<b>6</b>
Social-labor wasted	2	1	5	3
Social-food insecurity	7	2	9	4
Social-unspecified	1	1	0	0
<b>Total Social</b>	<b>10</b>	<b>4</b>	<b>14</b>	<b>7</b>
Economics	3	2	2	0
Not, but inefficient	0	0	1	1

One important difference between ER and OR interviewees was when those that spoke of food insecurity problems, and associated that with a modifier which indicated place, three from ER stated places outside of their own country, “Africa and Asia”, “low income countries” or spoke about “the world”. Those from OR said, “here” “the entire country” and “our country”. Placing this problem outside of Italy could mean that this group of respondents may not be as empathetic to people experiencing hunger outside of their own nation and not necessarily as motivated to fight food waste because of social issues.

For these participants, social issues are just as problematic as environmental issues, so targeting more environmentally impactful foods like meat is likely not to be, in their opinion, the most important solution to the problem of food waste. This finding interrupts the flow of logic from the beginning of this examination, and explains why there is not more emphasis on reducing wastage of meat in the food waste policy subsystem. Participants’ understandings are largely not reflected in the most recent laws. These laws for both regions have a more extensive focus on environmental emphases throughout the text of the laws. This environmental emphasis is evident when looking at who is charged with the responsibilities, as well as the goals and assessments outlined.

As the effects of climate change become realized, it is feasible that either one of these motivations of fighting food waste, social or environmental, would rise as the more dominant reason. If the opportunities to target the emissions from food become the focus as stated in SB 263 Sec. 9. (3)(a)(A), and the future paradigm of waste uses an approach looking at the whole life cycle of those foods as it is stated in RL 16 (Art. 3. 13.), then it would be important to know if stakeholders support targeted efforts towards types of food that cause more emissions than others.

### Food Waste and Targeting Meat

Question eight once again from the outset was designed to uncover participant generated meanings of food waste concepts so the line of questioning matched up with previous questions. The question asked, “Do you think the type of food wasted should be addressed in these policies? Why or why not?” If the interviewees did not define type in the initial answer, probing questions were used to uncover if they were meaning type in terms of food that has more impact on emissions. All but one participant ended up defining food type as those foods which have more environmental impact. For the rest, this question of type sought out whether stakeholders would support addressing food that is more impactful environmentally, which can be understood as meat due to emissions and climate change.

A little less than half of the Oregon participants first defined type as something other than environmentally impactful foods. Volume was offered as the current situation for four of these stakeholders mainly because this is how it is easily understood and quantified. The two that did not agree with focusing on type offered two reasons. One is for clarity of public messaging; that a food waste program should talk about food waste, while the other reason was that by addressing all waste one will still address the waste of meat. For ER, one participant answered that he would say it is appropriate to address type for environmental purposes, but obviously if the aim is to eliminate hunger

then type does not matter. The other stakeholder from ER that said no, reasoned that it is more important to put efforts toward specifying policy on the sector of the food supply chain.

When presented with targeting type of food being wasted as a solution, nearly all of these stakeholders made a judgement call that this is a reasonable avenue to explore in this policy subsystem, despite having carnist beliefs. What remains to be seen is whether actions will actually be taken in the future to address meat waste. Targeting meat as a thought experiment talking with a researcher is not a real-world condition, and has no consequences for them or others in their respective regions.

Hypothesis 2. If carnism is a shared ideology, then food waste mitigation strategies aimed at the wastage of meat; b. would not be seen as viable options, has little evidence since most participants agreed that addressing meat waste is a viable option. Hypothesis 2. d. is likely not caused by carnist beliefs based on the general conceptual understanding of volume based targets being defined by law and the low amount of meat wasted, combined with a low degree of carnism beliefs among these participants (2. If carnism is a shared ideology, then food waste mitigation strategies aimed at the wastage of meat; d. would receive less attention than other types of food that are wasted).

## Policy Recommendations

This research, along with extant literature, find that meat is a culturally important food, so much so that it may even define people's core identity, and has a system of beliefs tied to the consumption of it. Meat waste is a subject that needs to be dealt with in a way that will acknowledge this importance and the previously unexamined carnist bias in policy, while seeking to move toward behavior change. In the most immediate time frame, stakeholders' awareness about their own biases can allow for more thoughtful consideration of their actions on creating and carrying out food waste policies. Messaging targeting behaviors about meat waste, or raising awareness about the impact of the waste of that type

of food could be achieved in the next shortest time frame depending on the degree of research involved and collaborations created to craft messaging.

### Short Term

Stakeholders need to recognize the danger of cognitively homogenizing the population of vegetarians together with the population of carnists in that it may sway their stances on the level of public acceptability to certain recommendations for consumer behavior change. Although the dominant ideology supports eating meat, these beliefs may not be held by everyone in their sphere of influence. Moreover, what was shown with the stakeholders' degree of carnist beliefs, may indicate that there can be degrees of strength of beliefs in the public as well. These stakeholders can leverage their own low scale of carnism and empower others to create cultural change in Oregon and Emilia Romagna as awareness increases about the full life cycle of food and the impact of waste.

### Medium Term

Quested et al. write that it would be productive to join with other types of businesses that target various food issues and state, "The holistic approach also helps to avoid contradictory or confusing messages relating to food being given out by different organisations" (2012, p. 50). This statement needs to be applied to the wastage of meat. Many environmental organizations are proactive about sharing information about meat consumption and its environmental impacts upstream. It would be logical then to also apply this open communication model to the wastage of this product like it is for the consumption of it. To more fully comply with elements of SB 263 from 2015, Oregon stakeholders should include education materials to raise awareness on the impact of wasted meat targeted to residential wasters.

While personal and career specific experience and use of boundedly rational decision making about people who share a culture with the stakeholders can surely go a long way in development of

policies that properly serve the public, messaging in programs and policies need to be evidence-based. Learning from the University of Bologna, intergovernmental agreements or public private partnerships can be formed among local governments and research institutions such as Portland State University, Oregon State University or other consulting agencies to facilitate focus groups or develop surveys that seek to analyze competing messaging about food waste and meat which can then be piloted with varied audiences. An interdisciplinary team that also includes marketing experts would enhance the effectiveness of these materials. Households should be the continued target for these studies as findings from the review of literature and in this study also support efforts in this wastage sector.

One type of messaging can include implications for lowered consumption by saying, “Wasting 10% of meat equals (these impacts) whereas wasting 10% of meat analogues equals (these impacts)” alongside tips for reducing waste of this food. Another type would strictly adhere to waste only statements and also give a full list of tips that help households to waste less meat. Overall, the background needs to apply a frame of empowering those to act but not guilt them. Two items that should be analyzed from these types of messages would be respondent reactions and opinions as well as the effectiveness to reduce meat waste.

Assessments of emissions from any lowered amounts of meat waste from these types of messaging or the awareness type mentioned above, can then add to characterizations of embodied energy savings in ER outlined in RL 16 from 2015 and add to achieving outcomes related to waste management, that of GHG emissions as seen in SB 263 section 9.(3)(a)(A). Samples of organic waste created by households would need to characterize meat waste to be able to extrapolate the emissions savings.

## Long Term

Laws that codify environmental impact statements as justifications for prevention of wasted food should also include greater emphasis on social implications of wasted food either in wasted work by people or wasted food that could feed those experiencing hunger. This emphasis could quantify the number of hours and dollars lost or the number of meals that could have been made from the wasted food. This would serve to draw the issue of food waste closer to people, especially in Oregon, where stakeholders appear to be more driven to help local people, rather than across the globe. It would also expand the issue and motivate others that are not driven to prevent waste due to environmental harm.

Economic mechanisms may be used to change consumption or waste behaviors about meat foods. Participants advocated for cost increases of meat through internalizing the externalities of the environmental and emissions impacts from the production of this food, or at least removing any supports that artificially lower the cost of these foods. This may act as price signaling to consumers creating a higher perceived valuation of this food and lowering waste. If this is chosen as an option, a stepwise increase in prices or lowering supports would be needed to eliminate a shock to the system through a drop in demand, which would likely increase waste at the retail level.

For wasted food, positive incentives would be geared toward communications to customers showing cost savings of not wasting meat or negative through “pay as you throw” fees instituted by a municipal waste collection organization. The fees could then be used to provide transitions for workers from lowered demand of meat, like skills training or severance packages.

Future cross-cultural research on consequences of carnism among stakeholders should analyze global Eastern and Western cultures together. These global areas hold differing ideologies among politics, and food culture and serve as a maximum difference analysis. Methodologies that uncover



implicit bias through computer generated tests should be utilized in testing for this hidden and entrenched ideology much like those instruments that have been used in testing for racism and sexism.

Applications of these recommendations need to be tailored to regional needs. One of the deficits found in the ability of these current suggestions is due to not knowing whether the local agricultural productions are consumed locally. This is caused by the globalized nature of food systems. The use of Environmental Product Declarations in Italy can be a model for the US in how to start to bridge this gap.

## Discussion

Systematic exclusion of wasted meat in the past may be due to biased decision making based on the dominant ideology in meat eating cultures known as carnism. Policies and programs are subject to beliefs of the leaders that formulate and implement them. This observation has also been made among other policy subsystems that focus on agriculture or livestock and climate change. This bias may be invisible and cause lack of attention to the severity of wasting this food as evidenced by goals of food waste being reduction goals that homogenize all foods' impact even in a life cycle approach to understanding waste. Meat and more importantly, beef is more impactful to climate change than any other food using this LCA approach. Targeting consumers versus other sectors in the food supply chain in Europe and the US is valid due to people in these global regions' high wasting and meat consumption habits.

The results indicate a weak to moderate but definitively present ideology shared cross-culturally. Everyone in this study believes that eating certain animals is an acceptable behavior. Carnist beliefs were found to have a degree range. These stakeholders are possibly not representative of the majority of the people from the cultures they are a part of. Indicators of strength of carnism among

participants show that justifications for eating meat were more social rather than based on laws of nature and biological need.

Most have questioned eating meat; half mentioned people are raised on meat indicating a strong norm though, most may not perpetuate beliefs if challenged. They spoke of meat being an important food for their regions both in forming identity regionally and organizationally and for economic reasons. Eating meat also means social inclusion and group cohesion, or could mean high status. Meat is also understood for its negative valuations in the resources it takes to make that food, and in wasting the food: a life.

If meat is very linked to the core identity of a region, then suggesting any changes to people's diets could be a subject that remains taboo, or at least a sensitive topic requiring care and non-offensive language. This could help explain why it would be easier to leave any targeted messaging toward meat out of any conversations about climate change or about food waste. While these stakeholders understand negative aspects of productions and consumption of meat, the analysis illuminates carnism concepts that justify this behavior: participants' values and beliefs were incongruent, and mechanisms of psychic numbing were used, i.e. avoidance, objectification and routinization.

While all food that becomes part of a society's traditions can be resistant to change through the years, meat was presented as central and having value above other food. This arises from ancient and recent historical people's ascribed worth to meat which was derived from situations of food scarcity and rarity of this item. This is what is known as the scarcity heuristic where items that are perceived to be harder to get or make will be assumed to have a higher price and more desirability (Lynn, 1989). Despite shifting availability to abundance in these regions in recent years, the beliefs about the value of meat persist today. Along with these, a particular instance of confirmation bias, which is a part of ideology,

was shared. Only one person explained his story about this type of bias. It is likely that others may have similar accounts.

Some noted cross-country differences that were found are that OR politically speaking is either more conservative or more liberal when concerned with government overreach in communications about meat. Since they were not asked to identify their political stances, it is possible that these participants lie on either side of the political left right divide. Although, what can be said it that these Oregonians fall in line with the traditional American view of limited government. The ER participants may have more entrenched ideology due to responses that indicate meat eating culture in the region is more homogenous, meat is more hidden in the food, and the benefits of beans were less important when compared to meat. This conclusion may be contrary to the finding that to talk about eating less meat was perceived as easier than in Oregon for professional and personal communications.

There is a prevention focus among the stakeholders, which is supported by language in the regional laws. An avenue to motivate consumers to prevent their wasted food could be accomplished by increasing the value of food through increasing awareness of the environmental impact all along the food supply chain. These stakeholders feel that in addition to increasing knowledge, skills should be targeted for modification too. Reflecting findings in previous research, these participants also reported that many elements act upon an individual to create the final action of wasting. A unique perspective was brought to light when discussing Latino populations' differing values and motivations from non-Latinos on this subject.

All stakeholders eventually named animal products, and largely meat, as the most environmentally impactful foods, but the government's role in this matter is only to inform the public or use economic incentives to change behavior. But these shared views may differ across countries due to political stances of the people from ER who seemed more welcoming toward stronger government

pressure in this area of diet and climate change. Overall, mandates can be imposed for health or safety which this issue of meat and climate change is not.

Highlighting resource use of food productions can be used as a key motivator to reduce food waste, but this is a relatively new topic in both regions. Historically, other issues either economic or social rather than environmental have been used as key motivations. Compared to other sectors the addition of emissions from food waste and specifically meat waste may pale in comparison to other sectors warranting little to no attention.

## Limitations

### Interview Questions

The interview question order did not vary to leave the first responses unbiased by the last questions, but some introduction was required to recruit participants. They were primed for the interview with knowing the basic need of the research using the terms sustainable diets, low carbon footprint diet, and food waste. This may have influenced their answers to think about how these items relate. Also, the participants that viewed the questions before the interview may have been biased in the first two categories of questions in the interview, based on the questions in the final three categories.

The participant that had written their responses had more time to respond and edit their answers. It is unknown whether they had gone through the questions one by one or read them all and then answered. There was loss of visual clues and tone of voice that was sought with the other interviews to indicated level of importance for concepts.

Two double barreled questions occurred in the final interview guide, number four and fourteen, which can bias results. In question four, impact to the environment can be made in many other ways besides contribution to greenhouse gas production, but the intent was to assess participant knowledge

and whether meat would be identified as more impactful than other foods. For question fourteen it was assumed that if interviewees justifications were different than what they thought others would say as to why they eat meat, that they would voice this, and those justifications would be noted and explained.

## Language

With different languages, even if words can be translated, at times meanings are not able to come through. Certain emphasis and importance of parts of the conversation can be lost, thus the meaning can change. Those that speak English as a second language may not utilize words that convey their intended meaning due to the limited time and quick pace of an interview. The first two pilot interviews were solely in Italian with the help of an interviewer who is from the ER region. There were no opportunities for follow up questions from the researcher as on the spot interpretations were not conducted at the time. These interviews were later transcribed and translated with the use of a third party that was not present during the interview. There are certain body language signals that are lost with these two interviews as well. Two additional interviews that required English interpretation were carried out while the interview was in progress. While this allowed for follow up questions, for the sake of brevity, generalized statements were interpreted, but every word was not interpreted.

## Conclusion

This study sought to understand carnist beliefs among stakeholders in the food waste policy subsystem to both test and expand carnism theory, and to understand policy outcomes in the food waste subsystem. This research adds to the literature on both topics. It analyzed whether those who acknowledge the arguments for limiting impacts to the environment as concerns for preventing food waste would also agree that meat should be targeted due to its environmental impact. While it may not matter what participants think, only what they do, biases are often hidden, and impact actions in a split second. A person may not even know themselves whether they have made decisions that are biased.

Intentions of these stakeholders to support the idea of targeting meat waste through the food waste policy subsystem was not influenced by participants' carnism. This is probably due to strength of these beliefs not reaching a threshold of influence. Only one of the hypotheses proposed had enough evidence to be likely; 2.c. The hypotheses again are:

1. If a person believes that food waste is a problem because it contributes to GHG production or uses too many natural resources, then the wastage of meat would be recognized as a major category to focus food waste mitigation strategies on.
2. If carnism is a shared ideology, then food waste mitigation strategies aimed at the wastage of meat;
  - a. Would not be identified,
  - b. would not be seen as viable options,
  - c. would be purposefully ignored, or
  - d. would receive less attention than other types of food that are wasted.

Although the participants named meat as most impactful, environmental issues are just as much of a reason to fight food waste as social issues, so there is not enough evidence to support hypothesis 1. Hypothesis 2. a. is not plausible given that most stakeholders report discussions in this area and use the loss of resources as motivation for consumer communications, but this linkage to upstream damage is still fairly new. The findings on intentions and how those may be impacted by carnism, would mean that there is not enough evidence for 2. b. Beliefs about the value and importance of meat would make targeting this food a sensitive subject though, so hypothesis 2. c. is likely. The final sub-hypothesis, 2.d. is likely not caused by carnist beliefs based on the general conceptual understanding of volume based targets being defined by law and the low amount of meat wasted, combined with a low degree of carnism beliefs among these participants.

These two regions were similar across many elements at the outset of this research as well as among the findings. This is likely due to the purposive sample methodology which focused on key knowledgeable in the area of food waste reduction. The findings from the interview analysis are mostly supported and somewhat refuted by the content analysis of recent laws.

If the waste of meat continues to be consciously ignored and the effects of the wasted resources are overlooked due to people's bias against animals and toward meat foods, then this will cause the whole planet to face the overwhelming effects of climate change. The present study examined hidden philosophical biases that can help to explain similar outcomes in food waste policy in both Emilia Romagna and Oregon, and how carnism may be implicitly shaping these policies. It is important to understand decision-making processes of stakeholders in the food waste policy subsystem because they are the leaders who are identifying the problems, and uncovering the solutions that will resolve those problems.

These leaders are relying on their knowledge, but also their beliefs about the larger issues and the people that they are acting upon and held accountable to. Leaders in food policy and other policy fields need to have vision and be sensitive to the needs of those that they exert influence over. Leadership vision must balance the needs of those that are living in the present with the needs of social justice for those that will come after them to live in a world that is affected by climate change. This is how society can move forward in being sustainable. Sustainability in food systems deserves attention and offers many avenues for improvement including opportunities for progress in waste streams and consumer consumptive behaviors.

*Although we've made real progress in becoming more efficient on the energy side, not as much as we need to, but we have become more efficient, we are actually seeing a continual increase in the emissions that are coming out of the agricultural sector. And a lot of that has to do with changing diets around the world, as people want to increase meat consumption that in turn is spiking the growth of greenhouse gas emissions coming out of the agricultural sector. This offers a huge opportunity for entrepreneurs, businesses, scientists, [and] thought leaders to make progress in an area where we have not made as much progress as we can.*

Former President of the United States Barack Obama  
Milan Global Food Innovation Summit May 9, 2017

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## Appendix A. English Interview Guide, Recruitment and Consent Documents

### Interview Questions for Policy Makers or Public Administrators

*[Note: Questions in boxes are altered slightly for Researchers, Scientists or other Food Waste Experts]*

#### Overall

1. What do you understand the goals to be of creating food waste information campaigns made for household consumers?

#### Food Waste

2. Why do you think food waste is a problem?
3. What factors or elements did you in the past, or would you in the future think about when making or implementing food waste policies (as defined above)?

What factors or elements did you in the past, or would you in the future, think about when advocating for, or providing expert opinion on food waste policies (as defined above)?
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#### Climate Change and Diet

4. In terms of impact to the environment or contribution to greenhouse gas production, can you name any foods that are more impactful than others?
5. If there are certain foods that are contributing more to climate change, should the government be working to encourage people to eat less of these foods?
  - Why or why not?
6. If you were told to alter the type of food you ate to reduce your carbon footprint, describe the feelings you would have about changing your diet habits.
  - What do think you would you fear most about this process?
7. Has there ever been a time when someone has discussed the issue of carbon footprint or greenhouse gas production of food, during the planning or execution stages of food waste policies?
  - If yes, what were the feelings involved and outcomes produced?
  - If no, what do you think it would look like?
8. Do you think the **type** of food wasted should be addressed in these policies?
  - Why or why not?

#### General Food Preferences

9. What foods are most critical to your traditional holiday meals or other important life event meals? Briefly name a few of the main ingredients.
  - Have any meals or parts of meals for these occasions changed in the last 20-50 years?
10. Name at least one food that you would miss the most if you never had it again, and why.

#### Meat Questions

11. If a small child that you are very close to (family or closest friends) didn't want to or didn't like meat what would you tell them to convince them to eat it?



12. Do you think meat is cheap for what you get from it?
  - What do you get from it? (Cultural, biological or any other.)
13. Would you consider beans, peas and lentils cheap for what you get from them?
  - What do you get from them? (Cultural, biological or any other.)
14. Why do you think people in general, or you yourself, eat meat?
15. Have you ever questioned why you or others around you eat meat?
  - *[If they do not eat meat:]* What led you to question eating meat?
16. If you had to throw out a pound (0.5 kilogram) of meat vs a pound (0.5 kilogram) of equally priced fruits or vegetables, which would you be more bothered by, and why?
17. How would you feel telling someone to eat less meat professionally (results of research, etc. indicated it was a good option)?
  - a. How about personally, with friends or family?
  - b. For both a professional and for a personal setting, would your feelings be different if you were telling someone to eat less produce, grains or pulses?

### Demographics and Short Answer

Please circle yes or no or fill in the requested information for these questions.

1. Is the issue of food or agriculture as it relates to climate change more important or less important than other sectors that contribute to greenhouse gasses?    More    Less
2. Did the household you grew up in raise livestock for meat?    Yes    No
3. Have you in the past or do you now raise livestock for meat?    Yes    No
4. How much meat do you eat? (See model for reference size)
  - Is that amount per day, per week, or per year?
5. Do you think that people in your region eat a lot of meat?    Yes    No
6. Do you think they eat an excessive amount of meat?    Yes    No
7. Do you eat a lot of meat?    Yes    No
8. Do you think you eat an excessive amount of meat?    Yes    No
9. Age:
10. Gender:
11. Race or ethnicity:
12. Religion:
13. Yearly income - Personal or Household (if you make combined food purchases):
14. Weekly food purchases (Grocery and Food away from home):
15. Your parents' or guardians' combined income when you were born:
16. Number of siblings you had growing up:

### **Recruitment and Consent**

#### **Information**

Hello, my name is Amanda Rhodes. I am a student at Oregon State University in the Master of Public Policy program. I have been given the wonderful opportunity to work in collaboration with the University of Bologna under the guidance of Dr. Matteo Vittuari (Department of Agricultural Science and Technology). I really appreciate having the chance to gain information from you for my research because of your influence or potential influence in the way that policies about food waste are understood and made as well as how those policies can be linked to low carbon footprint diets.

The purpose of this interview is to provide information for use by a group of researchers associated with Oregon State University and the University of Bologna to gain a deeper understanding of the formation and implementation of food waste policy that will be geared toward changing consumer behavior. My goal is to understand processes that take place, and the beliefs that are held by people such as yourself that either have been or could be involved in these policies.

The approximately one hour-long (at most) interviews for this study are focused on comparing decision making processes in Oregon and Emilia-Romagna. We will seek to find whether there is a cultural bias for high greenhouse gas emitting foods, and how that may differ among the two regions. This might lead also to the identification of a set of best practices emerging from the comparative analysis among the two selected areas. Ultimately, we are looking to uncover why a sustainable diet could possibly be overlooked, dismissed, or downgraded in importance to the point of inaction in the policy making process for policies or solutions surrounding food waste. Your participation is important to us so that we can: 1. Improve the knowledge base on how policies come to be formed; 2. Understand the complex connection between food waste and sustainable diets (with a focus on low carbon footprint diets), and 3. Be able to produce better public guidance documents informed by leaders such as yourself.

### **Agreement**

If you agree to be in this study, please understand your participation is completely voluntary and you have the right to discontinue your involvement at any time before or during the interview, and to refuse to answer any of the questions.

We are providing you with our contact information. We have also included contact information for the Institutional Review Board at Oregon State University if you have any questions about your rights as a study participant.

If you agree, your identity will be made known in all written data resulting from the study. We will provide you with transcripts for your review.

If you **do not** wish for your name to be used and you prefer to remain anonymous, we will remove any indications of your identity contained within the interview, as well as destroying the recording once it has been transcribed into text.

Would you be willing to participate in the study to talk with me about food waste policy decision making and sustainable diets?

- **If your answer is no**, is there someone that I should speak with instead of you that would be a better fit given what you now know about the goals and purpose of this research? This could be anyone at all that you think could influence policy decisions in Emilia Romagna either at the regional or the municipal levels. It might be a person, a commission, a working group, stakeholders etc., and any direct contact you could provide would be extremely useful for the purpose of this research.

Do you give consent for your identity to be revealed in all written data resulting from this study?

So that I don't miss any information, I would like to ask your permission to record our discussion.

- Would you be willing to have me record the session?

## Appendix B. Italian Interview Guide, Recruitment and Consent

### Documents: Reclutamento e consenso verbale

#### **Domande di intervista per responsabili politici o amministratori pubblici**

*[Nota: Le domande nei riquadri sono leggermente modificate per i ricercatori, scienziati o altri esperti sullo spreco del cibo]*

##### In generale

1. Quali ritieni che possano essere gli obiettivi della creazione di una campagna informativa sullo spreco alimentare rivolta alle famiglie?

##### Spreco di cibo

2. Perché pensi che lo spreco del cibo sia un problema?
3. Quali fattori o elementi hai considerato in passato o considereresti in futuro, nella formulazione o implementazione delle politiche sullo spreco del cibo (come definite sopra)?

Quali fattori o elementi hai considerato o considereresti in futuro per sostenere o fornire pareri esperti sullo spreco alimentare? (come definito sopra)?

##### Cambiamenti climatici e diete

4. In termini di impatto per l'ambiente o contributo alla produzione di gas serra, puoi citare degli alimenti che hanno più impatto degli altri?
5. Se ci sono alcuni alimenti che contribuiscono maggiormente al cambiamento climatico, il governo dovrebbe incoraggiare la persona a mangiare di meno questi alimenti?
  - Perché sì o perché no?
6. Se ti dicessero di modificare il tipo di cibo che mangi per ridurre le emissioni di anidride carbonica, descrivi quali impressioni avresti sul cambiamento delle tue abitudini alimentari.
  - Cosa pensi che temeresti di più con questo cambiamento?
7. C'è mai stato un momento in cui qualcuno ha discusso la questione delle emissioni di anidride carbonica o di produzione di gas serra dal cibo, durante le fasi di progettazione o nella realizzazione di politiche di rifiuti alimentari?
  - Se sì, quali sono stati i sentimenti coinvolti e i risultati che hanno prodotto?
  - Se no, cosa pensi che sarebbe simile?
8. Pensi che la tipologia del cibo che viene sprecato dovrebbe essere preso in considerazione in queste politiche?
  - Perché sì o perché no?

##### Preferenze generali sul cibo

9. Quali sono gli alimenti più importanti per i vostri pasti nelle feste tradizionali o di altri importanti eventi della vita? Cita brevemente alcuni degli ingredienti principali.
  - Ci sono pasti, o parti di pasti di queste occasioni, che sono cambiati negli ultimi 20 – 50 anni?
10. Cita il cibo che ti mancherebbe di più se non potessi più mangiarlo, e perché.

##### Domande sulla carne

11. Se un bambino piccolo a te molto vicino (di famiglia o di amici) non volesse mangiare la carne o non gli piacesse, cosa gli diresti per convincerlo a mangiarla?

12. Pensi che la carne sia economica considerando quello che ottieni da essa?
  - Cosa ottieni da essa (Culturalmente, biologicamente o altro.)
13. Consideri fagioli, piselli e lenticchie a buon mercato per quello che ottieni da essi?
  - Cosa ottieni da essa (Culturalmente, biologicamente o altro.)
14. Perché pensi che le persone in generale, o tu stesso, mangiate la carne?
15. Ti sei mai posto il dubbio del perché tu o le persone intorno a te mangino carne?
  - *[se non mangi la carne:]* Cosa ti ha portato a non mangiarla?
16. Se dovessi buttare mezzo kg di carne o mezzo kg di verdura, entrambi dello stesso prezzo, cosa ti avrebbe disturbato di più, e perché?
17. Come ti sentiresti, in ambito professionale, a dire a qualcuno di mangiare meno carne?
  - a. E in ambito personale, con amici e famiglia?
  - b. In entrambi gli ambiti, professionale e personale, ti sentiresti diversamente se dicessi a qualcuno di mangiare meno prodotti agricoli, cereal o legumi?

### Demografia e risposte brevi

Si prega di cerchiare sì o no, o compilare le informazioni richieste per queste domande.

17. La tematica del cibo e dell'agricoltura collegata ai cambiamenti climatici è più o meno importante degli altri settori che contribuiscono alla produzione di gas serra? Più      Meno
18. nella casa in cui sei cresciuto, si allevava bestiame per la produzione di carne? Sì      No
19. In passato o attualmente hai allevato bestiame per la produzione di carne? Sì      No
20. Quanta carne consumi? (Vedi modelli per misure di riferimento)
  - Il quantitativo è al giorno, al mese o all'anno?
21. Pensi che le persone in questa regione mangino molta carne? Sì      No
22. Pensi che le persone in questa regione mangino troppa carne? Sì      No
23. Mangi molta carne? Sì      No
24. Pensi di consumare un quantità di carne eccessiva? Sì      No
25. Età:
26. Genere:
27. Razza o etnia:
28. Religione:
29. Reddito annuo - Personale o domestico (se si fanno acquisti alimentari in comune):
30. Acquisti alimentari settimanali (Spesa e cibo fuori casa):
31. Il reddito congiunto dei tuoi genitori o tutori quando sei nato:
32. Numero di fratelli e sorelle con cui sei cresciuto:

### **Reclutamento e consenso verbale**

#### **Informazioni**

Salve, il mio nome è Amanda Rhodes. Sono una studentessa presso la Oregon State University del Master di Politiche Pubbliche. Mi è stata data la meravigliosa opportunità di lavorare in collaborazione con l'Università di Bologna sotto la guida del Dr. Matteo Vittuari (Dipartimento di Scienze e Tecnologie Agrarie). Apprezzo molto la possibilità di ottenere informazioni da voi per la mia ricerca data la vostra influenza, o potenziale influenza, nel modo in cui le politiche sui rifiuti alimentari vengono comprese e realizzate, e come possono essere collegate a diete a bassa emissione di anidride carbonica.

Lo scopo di questa intervista è quello di fornire informazioni per l'utilizzo da parte di un gruppo di ricercatori associati alla Oregon State University e l'Università di Bologna, di acquisire una più profonda

comprensione sulla realizzazione e attuazione della politica dei rifiuti alimentari che sarà orientata verso il cambiamento del comportamento dei consumatori. Il mio obiettivo è quello di capire i processi che hanno luogo, e le idee di persone come te, che sono state o potrebbero essere coinvolte in queste politiche.

Le interviste, della durata di un'ora circa, sono focalizzate sul confronto dei processi decisionali in Oregon ed Emilia-Romagna. Cercheremo di scoprire se vi è un pregiudizio culturale nei confronti degli alimenti che emettono alti livelli di gas serra, e come eventuali pregiudizi possono differire tra le due regioni. Questo potrebbe portare anche all'individuazione di una serie di migliori pratiche, emergenti dall'analisi comparativa tra i due territori selezionati. Infine, stiamo cercando di scoprire il motivo per cui una dieta sostenibile potrebbe essere trascurata, respinta, o declassata di importanza, al punto di inattività, nel processo di definizione delle politiche e delle soluzioni che riguardano i rifiuti alimentari. La vostra partecipazione è importante per noi, in questo modo possiamo: 1. Migliorare la base di conoscenze su come le politiche vengono a formarsi; 2. Comprendere il complesso rapporto tra i rifiuti alimentari e diete sostenibili (con particolare attenzione alle diete a basso impronta di carbonio), e 3. Essere in grado di creare migliori documenti di orientamento pubblici divulgati dai leader come voi.

### **Accordo**

Se l'utente accetta di essere in questo studio, sappia che la partecipazione è completamente volontaria e si ha il diritto di interrompere il suo coinvolgimento in qualsiasi momento prima o durante l'intervista, e di rifiutare di rispondere a qualsiasi domanda.

Vi stiamo fornendo le nostre informazioni di contatto. Abbiamo anche incluso le informazioni di contatto per l'Institutional Review Board della Oregon State University, se avete domande sui vostri diritti come partecipante allo studio.

Se siete d'accordo, la vostra identità sarà resa nota in tutti i dati scritti risultanti dallo studio.

Provvederemo a fornirti il testo scritto dell'intervista. Se non si desidera che il proprio nome venga utilizzato e si preferisce rimanere anonimo, provvederemo a rimuovere eventuali indicazioni della vostra identità contenute all'interno dell'intervista, oltre a distruggere la registrazione una volta che è stato trascritto il testo.

Sareste disposti a partecipare allo studio per parlare con me delle decisioni politiche che riguardano i rifiuti alimentari e delle diete sostenibili?

- **Se la risposta è no**, c'è qualcuno con cui potrei parlare, la cui scelta sarebbe migliore dato quello che ora sappiamo circa gli obiettivi e le finalità di questa ricerca? Questa potrebbe essere una persona qualsiasi che si pensi possa influenzare le decisioni politiche in Emilia Romagna sia a livello regionale che a livello comunale. Potrebbe essere una persona, una commissione, un gruppo di lavoro ecc; qualsiasi contatto diretto che si fornisce sarebbe estremamente utile ai fini di questa ricerca.

Dà il consenso a rivelare la propria identità in tutti i dati scritti risultanti da questo studio?

In modo da non perdere alcuna informazione, vorrei chiedere il suo permesso a registrare la nostra discussione.

Sareste disposti a farmi registrare la conversazione?

## Appendix C. Meat Eating Justifications Codes

Table 8. Coding descriptions for meat eating justifications studies 1a and 1b (Piazza et al., 2015, p. 116).

Category	Definition	Examples
Natural	Appeals to biology, biological hierarchy, natural selection, human evolution, or the naturalness of eating meat.	"It is natural for humans to eat meat"; "Humans are carnivores"; "Evolutionarily hominids have always eaten meat"; "Organisms consuming each other is something that is prevalent in nature"; "Humans were meant to have dominion over animals"
Necessary	Appeals to the necessity of meat for survival, strength, development, health, animal population control, or economic stability.	"Humans need meat to survive"; "Our bodies need the protein"; "Meat provides good nutrients"; "Protein is a necessary part of our diet"; "Because if we didn't, there would be an overabundance of certain animals"
Normal	Appeals to dominant societal norms, normative behavior, historical human behavior, or socially constructed food pyramids.	"Society says it's okay"; "I was raised eating meat"; "Meat is culturally accepted"; "A lot of other people eat meat"
Nice	Appeals to the tastiness of meat, or that it is fulfilling or satisfying.	"It tastes good"; "It's delicious"; "Tastes great (I mean bacon...come on)"
Humane slaughter	Appeals to the "humane" nature of slaughtering practices.	"As long as you know it comes from a company that does not mistreat animals"; "Humane options exist for meat products"
Religion	Appeals to religion, scripture, God, or divine sovereignty, without also appealing to human nature, biology, or social norms.	"It's allowed by my religious creed"; "According to God there is no unclean animals to eat"; "God provided them for us to eat"
Sustainable	Appeals to the sustainable nature of meat as a renewable resource.	"Fish create less waste than other animals"
Miscellaneous	Miscellaneous arguments (e.g., appeals to dietary freedom, availability of meat, inferiority of animals, etc.).	"It's readily available"; "The animals are already killed"; "Animals are not nearly as intelligent as humans"; "This is America and I am free to do what I want"
Unscorable	Does not answer the question or rejects the premise that eating meat is not OK.	"I am not a vegetarian"; "It's not morally wrong"

## Appendix D. Participants

Table 9 Participants' job description by category		
	Emilia Romagna	Oregon
Policy Makers	<ol style="list-style-type: none"> <li>1. Regione Emilia Romagna Assemblea legislative, Consigliere, Partito Democratico (Councilor, Democratic Party)</li> <li>2. Same as above, Sinistra Italiana (Italian Left)</li> </ol>	<ol style="list-style-type: none"> <li>1. Oregon State Legislature, Representative, Republican</li> </ol>
Public Administrators	<ol style="list-style-type: none"> <li>1. Agenzia Territoriale dell'Emilia-Romagna per i Servizi Idrici e Rifiuti, Funzionario tecnico (Emilia Romagna Territorial Agency for Water and Waste Services, Technical Officer)</li> <li>2. L'Agenzia regionale per la prevenzione, l'ambiente e l'energia dell'Emilia-Romagna (Arpa) (The Regional Agency for the Prevention, Environment and Energy of Emilia-Romagna), Project manager/ Researcher in environmental economics</li> </ol>	<ol style="list-style-type: none"> <li>1. Oregon Department of Environmental Quality Materials Management Environmental Solutions Division, Natural Resource Specialist</li> <li>2. City of Eugene Planning &amp; Development Waste Prevention &amp; Green Building, Analyst</li> <li>3. Washington County Solid Waste &amp; Recycling, Senior Program Coordinator</li> <li>4. Lincoln County Sustainability and Solid Waste Management, District Manager</li> <li>5. Portland Metro Resource Conservation &amp; Recycling, Principal Planner</li> <li>6. Marion County Public Works Environmental Services, Waste Reduction Coordinator</li> <li>7. Oregon State University Housing &amp; Dining Services, Assistant Director-Nutrition &amp; Sustainability</li> </ol>
Experts and Scientists	<ol style="list-style-type: none"> <li>1. Università di Bologna, Dipartimento di Scienze e Tecnologie Agroalimentari (DISTAL), (Department of Agricultural and Food Sciences, University of Bologna), Assistant Professor</li> <li>2. Same as above, Research Fellow Post-Doc</li> <li>3. University of Bologna Department of Agricultural Economics Faculty of Agriculture, Policies for Sustainable Development, ICTS and Climate Change, Researcher</li> <li>4. Last Minute Market, Co-founder and Representative</li> <li>5. Fondazione Banco Alimentare Emilia Romagna ONLUS, Direttore operativo (Food Bank ER, Director of operations)</li> <li>6. Granarolo S.p.A, Responsabile Comunicazione Resp. Relazione Esterne e Comunic. Istituzionale (Communication, External Relations and CSR Manager)</li> <li>7. Cooperativa Italiana di Ristorazione s.c., Responsabile Sistemi Certificati, (Italian Catering Cooperative, Certified Systems Manager)</li> </ol>	<ol style="list-style-type: none"> <li>1. Port of Portland, Senior Land Quality Manager</li> <li>2. Portland State University, Instructor / Community Environmental Services, Director</li> <li>3. Oregon Green Schools, Board Chair</li> <li>4. Mid Valley Harvest, President</li> <li>5. food donation facility, anonymous</li> <li>6. Oregon Refuse and Recycling Association, Governmental Affairs Director</li> </ol>