

# Avoiding food waste by Italian consumers: related beliefs, attitudes, behaviour and the importance of planning and shopping routines



Fiore M., Contò F. , Conte A., Pellegrini G.  
University of Foggia, Department of Economics, Foggia, Italy



**Presenter:** Alessandra Conte (PHD Student)  
University of Foggia, Department of Economics

# AGENDA



- Objectives
- Literature Background
- Data Collection
- Measurement of Constructs
- Data Analysis and Results
- Conclusions
- Further research steps

**Keywords:**

Food waste

Shopping routines

Consumer Behaviour

Theory of Planned Behaviour

# Objectives



1. To study food waste from a food-related behaviour perspective;
2. To explore its possible drivers among Italian consumers.

....consumers are the single biggest contributor to the total volume of food waste generated over the world (Griffin et al., 2009) but little is known about the drivers of food waste in households (Stefan et al., 2012).

# Literature Background



Following the work of Stefan et Al. (Food Quality and Preference, 2012),

the **Theory of Planned behaviour** (Ajzen, 1991)

is our starting point to predict household decisions in order to minimize or recycle waste (Biswas et al. 2000; Knussen et al., 2004) as well as to improve food-related behaviours (Conner & Armitage, 2002).

The TPB posits that **intentions** can be predicted by

- **attitudes** examined with two concepts( lack of concern about food waste; moral aspects)
- **subjective norms** (referred to what is considered approved or disapproved behaviour in a specific situation( people should intend to waste less food if wasting food is disapproved by important others)
- **perceived behavioural control** relates to the degree to which consumers think reducing food waste is under their control

# Literature Background



In addition to intentions not to waste food, **planning and shopping routines** may be relevant in explaining the amount of food waste.

Checking inventory, making shopping list, planning meal in advance may help consumers to decrease unplanned purchases and limit food waste (Bell, Corsten, & Know, 2011)

# Data Collection



- **Period:** September-December 2014.
- **Instrument:** web-based questionnaire using an on line software.
- **Questionnaire design:** Items were developed by the authors based on previous studies. (Stefan et Al. 2012). Pilot test with about 12 respondents to support questionnaire design.
- **Survey:** distributed to Italian consumers\* through online platforms (Email, Facebook, LinkedIn) and a link was sent to potential respondents who were asked to forward it to friends and acquaintances (Stefan et al., 2012).
- **Final sample:** 256 respondents.
- **Data analysis:** software STATA

\*that have some responsibility in both cooking and shopping or at least half of the responsibility for at least one of them (Stefan et Al. 2012)

# Measurement of Constructs



- Questions on **food waste** were asked at the beginning in order to avoid other questions from bias
- **Food waste behaviour** was measured with 1 item on general food waste and 4 items on the waste of specific perishable foods
- **Intentions** were measured in relation to avoidance of food waste
- **Planning routines** were measured with 3 items related to planning of shopping and meals
- **Shopping routines** with 2 items referring to excess purchasing of food
- **Attitudes towards food waste** were composed of 2 constructs (moral attitudes and lack of concern)
- **Subjective norms** and **Perceived behavioural control** (with 2-3 items)
- In addition: socio-demographics, consumers' awareness regarding the type of food they waste and its consequences, their involvement with food and the frequency of shopping trips were included as background characteristics.

# Data Analysis and Results

**Respondents' demographics are in line compared to the general population**

	Sample		Population	
<b>Household size (mean)</b>	2.99		3.05	
<b>Presence of children</b>	16%		15.97%	
<b>Number of children (mean)</b>	0.31		0.3	
<b>Age (mean)</b>	36.576		36.582	
<b>Gender</b>	49.22% of female male	50.78% of	49.25% of female male	50.75 of
<b>Area of residence</b>	Italy			

# Data analysis and Results



<b>Background variables of consumers' food waste</b>	<b>Mean</b>	<b>Standard deviation</b>
<b>Awareness</b>		
I know exactly how much food we throw away every day	5.00	1.65
I know exactly what kind of food we throw away	5.30	1.40
I am aware of how much money I pay weekly for food that gets thrown away	4.84	1.67
Food waste is a problem for the environment despite it is natural and biodegradable	5.33	1.64
The fact that I waste food does not affect the undernourished people in the world because anyway I could not give that food to them	3.25	1.99
<b>Food involvement</b>		
How would you rate your general involvement with food?	5.22	1.68

The Italian respondents report being involved with food issues and being relatively aware of how much food they waste and how much they pay for the food they waste.

# Results

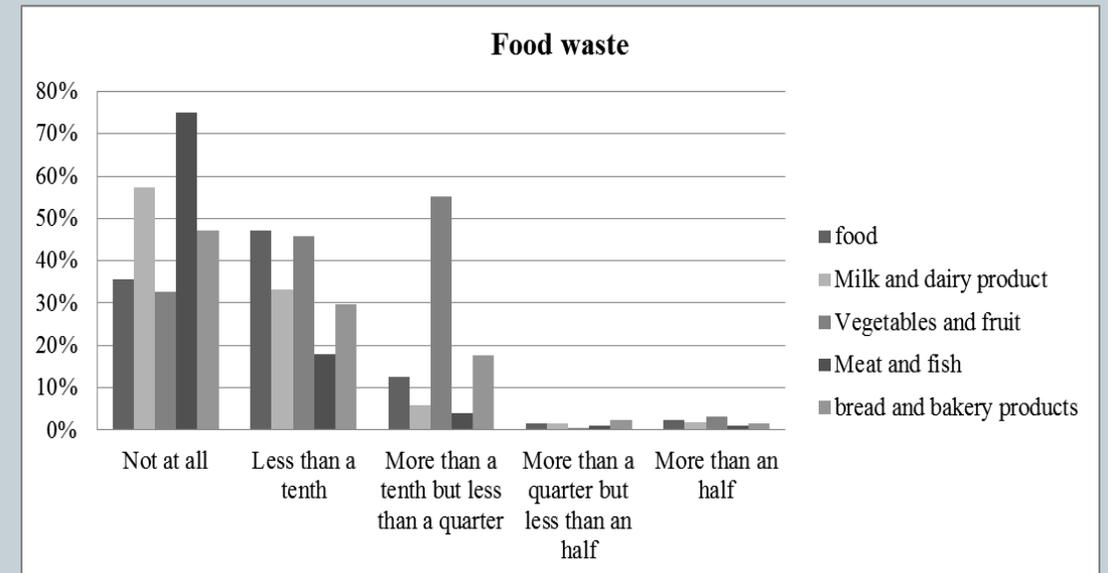


- **Food items that are more wasted are**

1. vegetables and fruit
2. milk and dairy products an
3. bread and bakery products
4. meat and fish.

- **Food waste in general**

1. 46.5 % not wasting food
2. 32.5% wastes less than a tenth of food that purchases in a week
3. 17.8% wastes an amount between a tenth and a quarter of food that purchases in a week.
4. 1.3% wastes an amount comprised between a quarter and half of the food we purchases in a week.
5. 1.9% wastes more than an half of that purchased in a week.

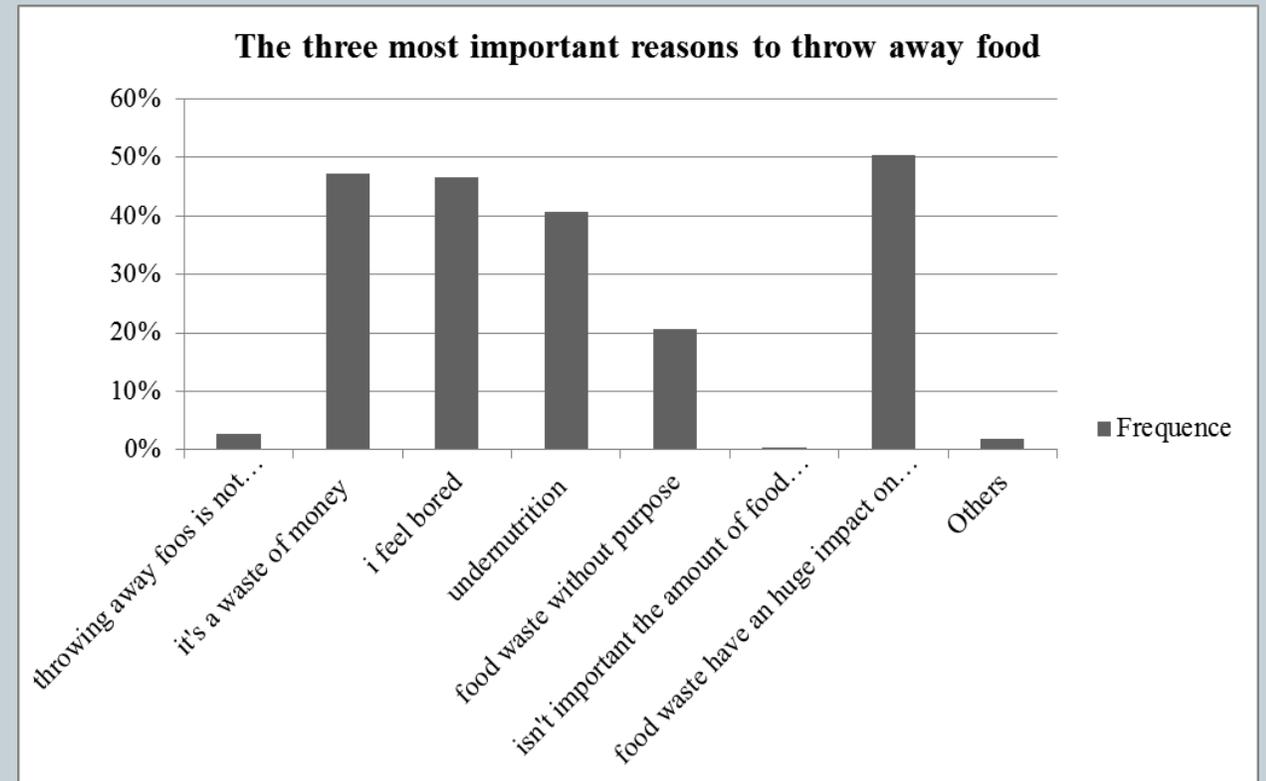


# Data Analysis and results



The three main reasons to **throwing away less food** as possible are:

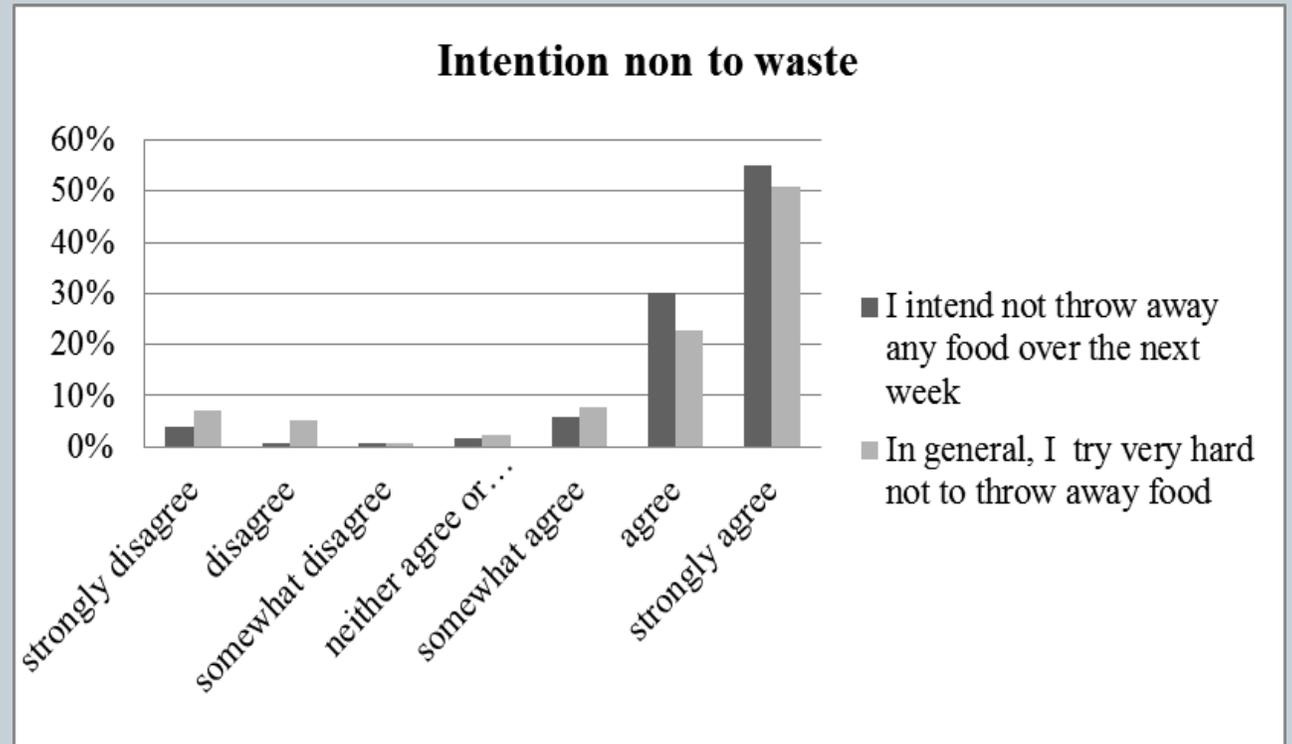
1. Environmental reason: wasting less has an positive impact on the environment
2. Saving money: wasting food is a waste of money
3. Don't feel guilty
4. World's undernutrition



# Data analysis and results



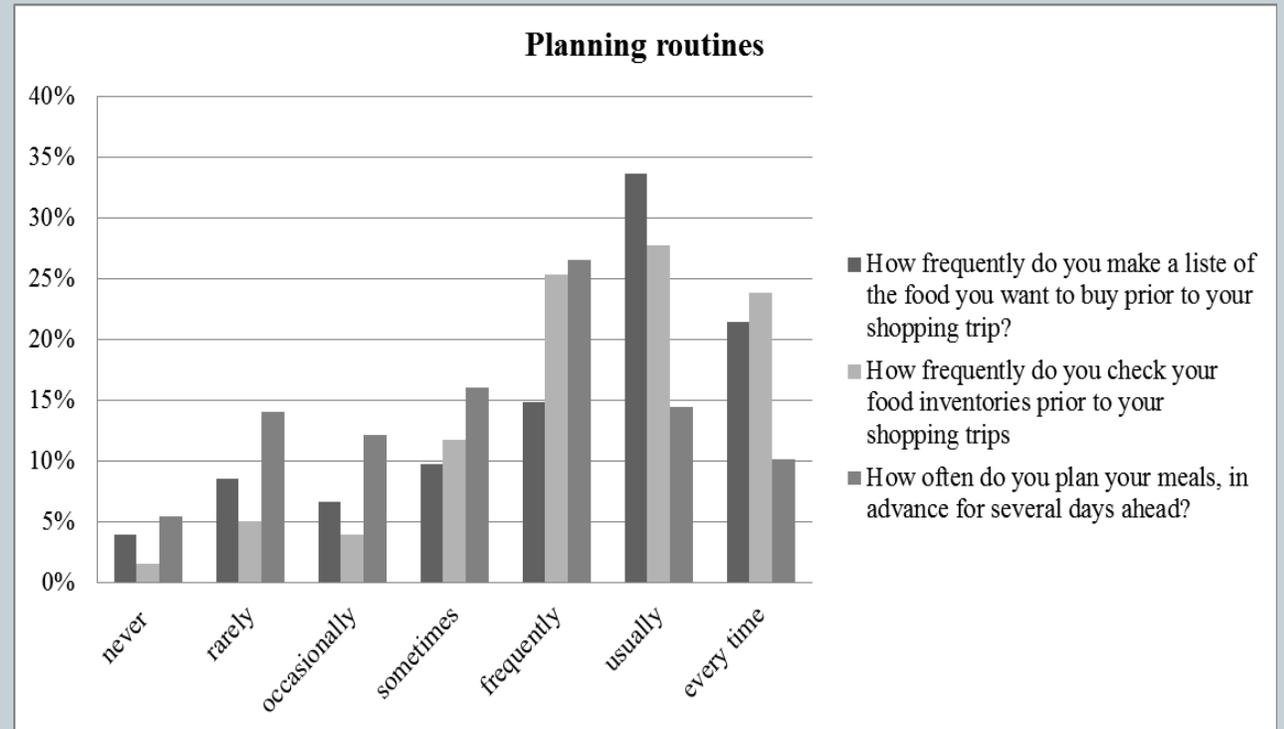
- The 55.1% strongly motivated to not throw away any food over the next week
- The 50,8% of the people are trying hard not to throw away food



# Data analysis and Results



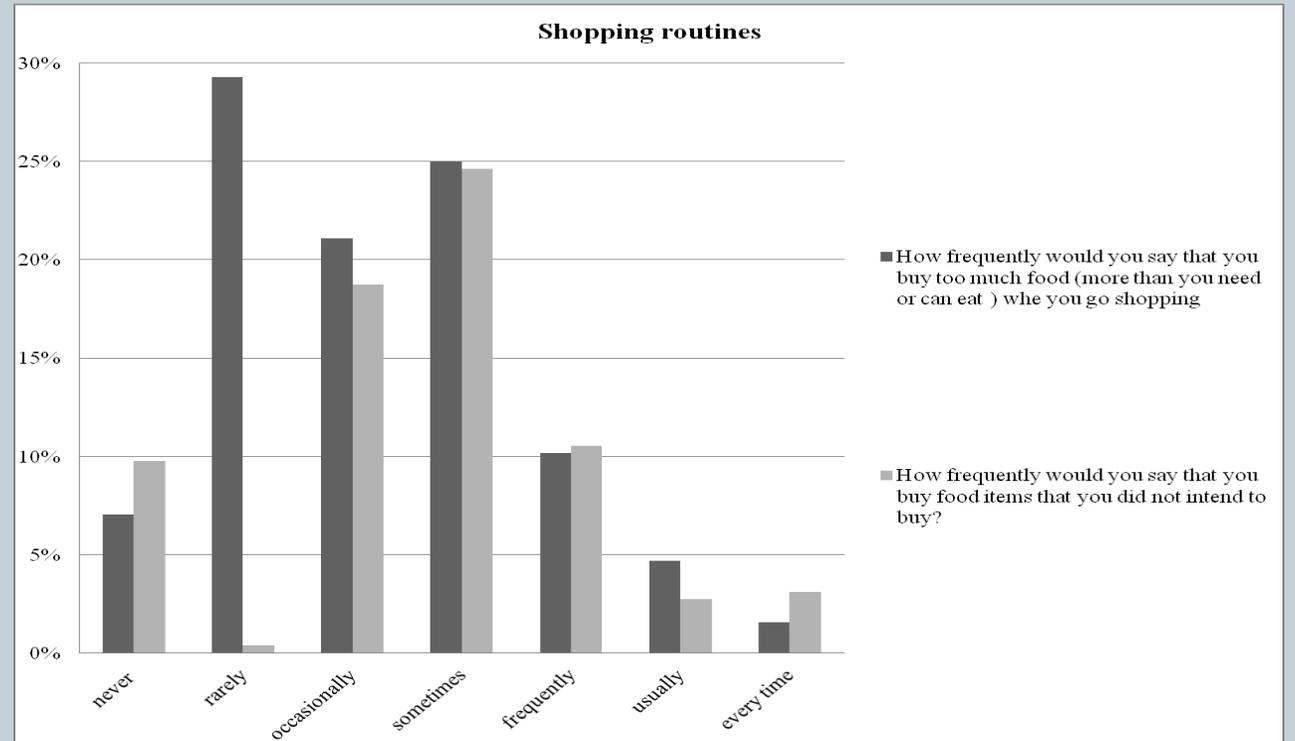
- **Shopping List**
  - 21.5% every time
  - 35.6% usually
- **Food inventories check**
  - 23.8% every time
  - 23.8% usually
- **Plan meal in advance**
  - 10.2% every time
  - 14.4% plans usually meals.



# Data analysis and Results



- **Buy more food than they need when they go to shopping**
  - 10,2% frequently
- **Buy food item not in plan to buy**
  - 10.6 % frequently

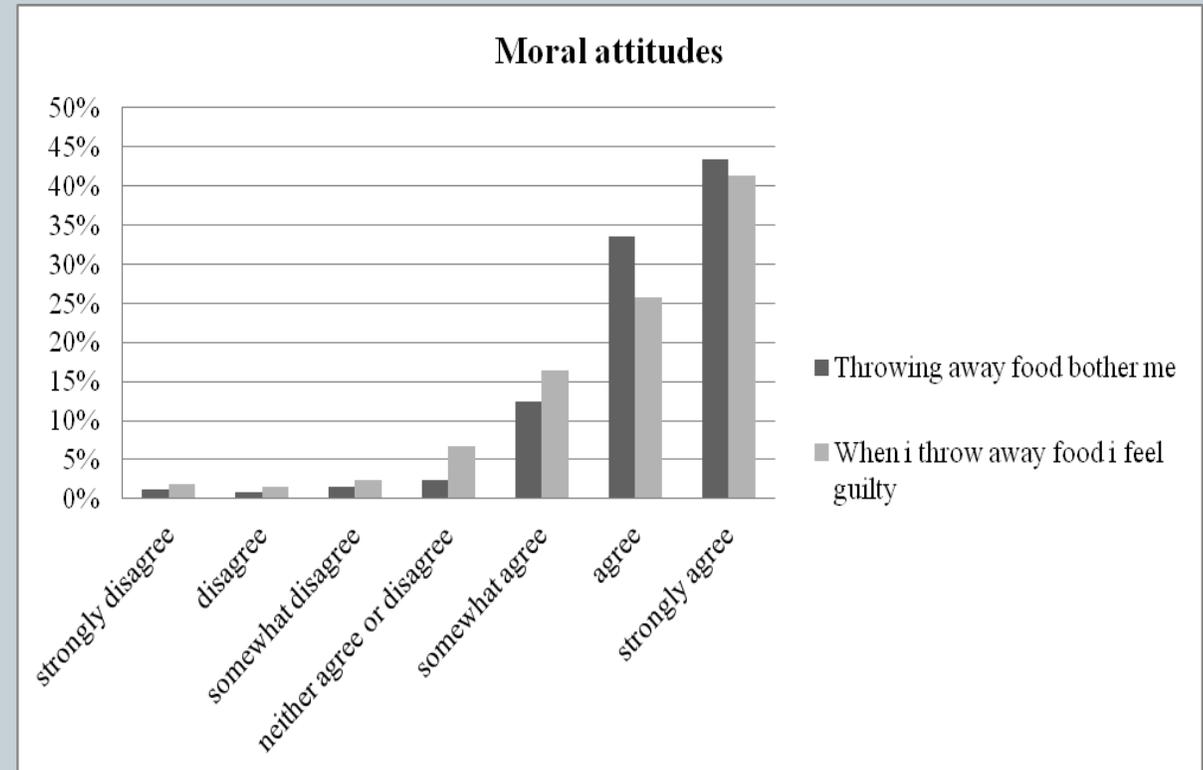


# Data analysis and Results



## Moral attitudes

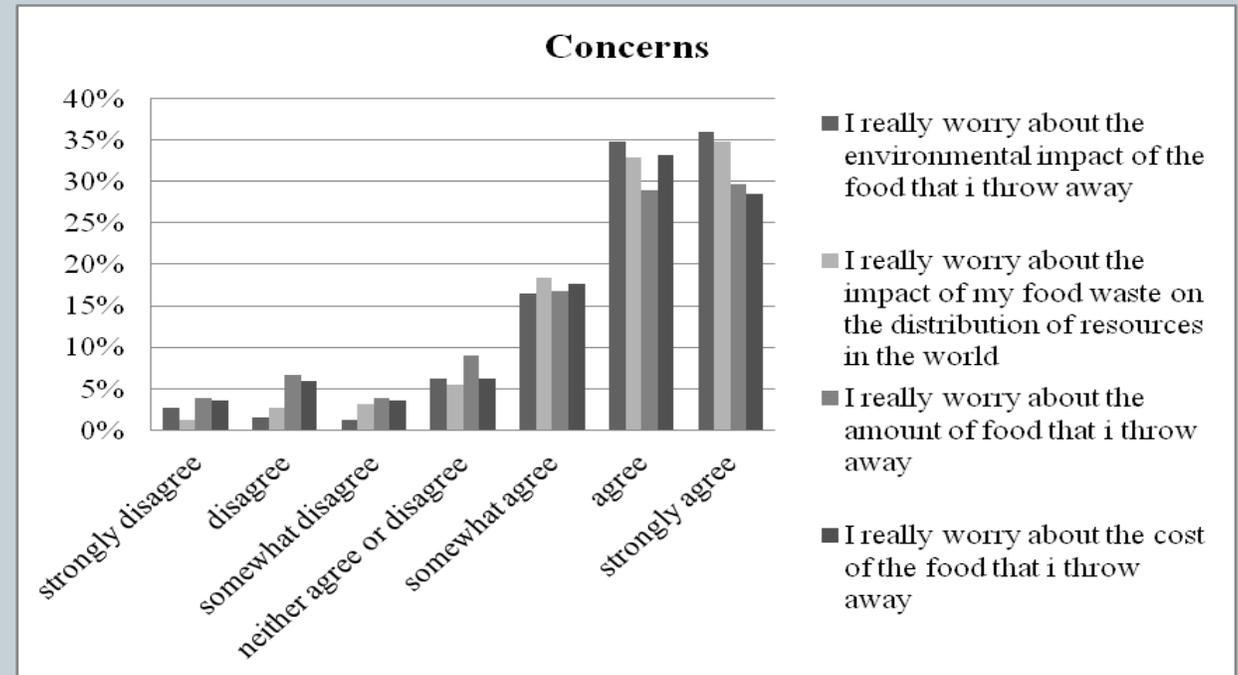
- 43,6 % **cares** so much when thrown away food
- 41.4% **feels guilty** so much when thrown away food



# Data analysis and results

## Concerns

- 35.9% is really worried about the **environmental impact** of the food it throws away.
- 34.7% is really worried about the impact of its food waste on the **distribution of resources**.
- 29.7% is really worried about the amount of food that it throws away.
- The 28.5% is really worried about **the cost** of the food that it throws away.



# Data Analysis and Results



## **Pearson correlation analysis**

To highlight significant relationships between the 14 selected variables on the 20 total variables.

They are as follows:

- 1 = Food waste
- 2 = Intention not to waste food- General
- 3 = Planning routines - List
- 4 = Planning routines –Check of inventories
- 5 = Planning routines –Plan of meals
- 6 = Shopping routines – Buying too much food
- 7 = Shopping routines – Items that you did not intent to buy
- 8 = Moral attitudes – Throwing away food bother me
- 9 = Moral attitudes – Throwing away food make me guilty
- 10 = Awareness – I know exactly how much food we throw away
- 11 = Awareness – I know exactly what kind of food we throw
- 12 = Awareness – How much money I pay weekly for food waste
- 13 = Awareness – Problem for the environment as it is natural and biodegradable
- 14= Awareness – Waste food does not affect the undernourished people in the world

# Data analysis and results

	1.Food waste	2.Intention not to waste food-General	3.Planning routines - List	4.Planning routines – Check of inventories	5.Planning routines – Plan of meals	6.Shopping routines – Buying too much food	7.Shopping routines – Items that you did not intent to buy	8.Moral attitudes – Throwing away food bother me	9.Moral attitudes – Throwing away food make me guilty	10.Awareness – I know exactly how much food we throw away	11.Awareness – I know exactly what kind of food we throw	12.Awareness – How much money I pay weekly for food waste	13.Awareness – Problem for the environment as it is natural and biodegradable	14.Awareness – Waste food does not affect the undernourished people in the world
<b>1</b>	1	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>2</b>	-0.05	1	-	-	-	-	-	-	-	-	-	-	-	-
<b>3</b>	-0.09	0.00	1	-	-	-	-	-	-	-	-	-	-	-
<b>4</b>	-0.17**	0.07	0.60***	1	-	-	-	-	-	-	-	-	-	-
<b>5</b>	-0.03	0.06	0.41***	0.50***	1	-	-	-	-	-	-	-	-	-
<b>6</b>	<b>0.23***</b>	-0.00	-0.03	-0.12	-0.02	1	-	-	-	-	-	-	-	-
<b>7</b>	0.18**	0.04	-0.09	<b>-0.21***</b>	-0.12	0.47***	1	-	-	-	-	-	-	-
<b>8</b>	<b>-0.10</b>	<b>0.27***</b>	0.09	0.15*	0.10	-0.16*	-0.07	1	-	-	-	-	-	-
<b>9</b>	0.01	<b>0.17***</b>	0.08	0.06	0.021	-0.07	0.00	0.67***	1	-	-	-	-	-
<b>10</b>	-0.00	0.18**	-0.04	0.00	0.06	0.04	0.07	0.18**	0.18**	1	-	-	-	-
<b>11</b>	-0.03	0.06	-0.04	0.04	0.05	0.07	0.06	0.16*	0.16**	0.84***	1	-	-	-
<b>12</b>	0.17**	0.03	-0.13*	<b>-0.25***</b>	<b>-0.28***</b>	<b>0.29***</b>	<b>0.26***</b>	-0.05	0.05	0.10	0.16	1	-	-
<b>13</b>	-0.09	0.15*	0.04	0.15*	<b>0.24***</b>	-0.17**	-0.15*	0.10*	0.12*	0.14*	0.10	-0.26**	1	-
<b>14</b>	-0.16**	0.15*	0.08	0.19**	<b>0.31***</b>	<b>-0.23***</b>	-0.22***	0.16*	0.15*	0.11	0.09	-0.26**	0.72***	1

\* p < .05 - \*\* p < .01 - \*\*\* p < .001

# Conclusion



- **Consumers' food waste** is driven mainly by their food provisioning-related routines rather than by an intention not to waste
- Furthermore, **consumers' routines** are influenced by feelings of guilt and perceived behavioural control with respect to planning and shopping skills.

**Consumers' routines** with regards to planning and shopping for food are important constructs to consider when studying food waste, moreover models of consumers' food waste should take into account **both general and moral attitudes, together with consumers' perceived behavioural control.**

# Conclusions



This study provides basic knowledge for developing **social marketing campaigns** aimed at decreasing the level of food waste generated at household level.

**Campaigns** should be aimed at:

- influencing consumers' practices related to food - giving people **practical tools** to enhance their routines (food purchasing, meal and storage practices) can decrease food waste ;
- changing people's attitude towards food waste, making consumers feel more **morally obliged** and therefore persuade them to make changes in their planning and shopping routines that would results in lower food waste;
- focus on **waste prevention approaches**, such as developing packaging design researches to find innovative solution to protect the food properly and allow the consumer to use the product fully (Silvenius et al., 2014) or strengthening the donation to social services (Lebersorger and Schneider F., 2014).

# Further research steps



- Because of culture is known to have an impact on consumers' food waste behaviour (Stuart, 2009), it may be, also, interesting to compare our results with ones of the similar past studies, that involved other countries. This can be crucial to provide basic guidelines for developing policies and campaigns aimed at decreasing the level of food waste generated in household;
- Consumers consider food waste to be a food-related behaviour and as such more related to factor that influence food choice (Steptoe, Pollard & Wardle, 1995) or They perceive its environmental and social implications? To explore whether framing food waste-related messages as environmental ones or social ones would increase the role of norms in explaining food waste behaviour.



Thank you

		HOUSEHOLD FOOD WASTE							
FORTE		GENERAL QUESTIONS							
	1	Gender	woman	man					
	2	Age	....						
	3	What is the composition of your household?	I live alone	I live together with my parents/husband/wife	other, namely ....				
	4	How many persons does your household count?	1 person=me	2	3	4	5	6 more than 6	
	5	Is there in your household presence of children (<18 years)	yes	no					
	6	Number of children in your household	....						
V.Stefan et al.2012	7	How much ....would you say that you throw away, of what you buy and/or grow, in a regular week?	not at all	less than a tenth	more than a tenth but less than a quarter	more than a quarter but less than an half	more than an half		
		FOOD							
		MILK AND DAIRY PRODUCTS							
		FRESH FRUITS AND VEGETABLES							
		MEAT AND FISH							
		BREAD AND OTHER BAKERY PRODUCTS							
	8	Why do you throw away food?	the portion was too big	I don't like the meal	I did not know how to store it	the product was next to its expiration date	I forgot it in the fridge	Other, namely....	
Milieu Centraal	9	How often do you throw products away which have reached their expiring date?	I only throw products away when the content does not look good or smell good anymore	I sometimes throw products away, if the expiration date has passed	I often throw products away, when the expiration date has passed	I always throw products away when the expiration date has passed	Other, namely...		
Wageningen UR	10	What are for you the 3 most important reasons to throw away as little food as possible?	I do not find it important to throw away as little food as possible	It is a waste of money	It gives me bad feeling. Throwing food away	There is already much hunger in the world	By wasting food I also waste unnecessarily	It does not matter how much food I waste	Wasting less, means less waste which is better for the environment

		INTENTION							
V.Stefan et al.2012	11	How likely is it that you will not throw away food during the next week?	not at all likely	Slightly likely	Moderately Likely	Neutral	Likely	Very Likely	Extremely Likely
V.Stefan et al.2012	12	I intend not to throw away any food over the next week	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
V.Stefan et al.2012	12	In general, I try very hard not to throw away food	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
	13	<b>PLANNING ROUTINES</b>							
V.Stefan et al.2012		How frequently do you make a list of the food you want to buy prior to your shopping trip?	never	rarely	occasionally	sometimes	frequently	usually	every time
V.Stefan et al.2012		How frequently do you check your food inventories prior to your shopping trip?	never	rarely	occasionally	sometimes	frequently	usually	every time
V.Stefan et al.2012		How often do you plan your meals, in advance, for several days ahead?	never	rarely	occasionally	sometimes	frequently	usually	every time
	14	<b>SHOPPING ROUTINES</b>							
Brook Lyndhurst (2007)		HOW FREQUENTLY WOULD YOU SAY THAT YOU BUY TOO MUCH FOOD (MORE THAN YOU NEED OR CAN EAT) WHEN YOU GO SHOPPING?	never	rarely	occasionally	sometimes	frequently	usually	every time
Exodus (2007)		How frequently would you say that you buy food items that you did not intend to buy?	never	rarely	occasionally	sometimes	frequently	usually	every time
	15	<b>LACK OF CONCERN</b>							
V.Stefan et al.2012		I do not really worry about the environmental impact of the food that I throw away	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
V.Stefan et al.2012		I do not really worry about the impact of my food waste on the distribution of resources in the world	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
Exodus (2007)		I do not really worry about the amount of food that I throw away	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
Exodus (2007)		I do not really worry about the cost of the food that I throw away	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
	16	<b>SUBJECTIVE NORMS</b>							
V.Stefan et al.2012		Most people important to me disapprove of me cooking/preparing more than enough food	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
V.Stefan et al.2012		Most people important to me disapprove of me throwing out some food	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
	17	<b>PERCEIVED BEHAVIOURAL CONTROL</b>							
V.Stefan et al.2012		it is very difficult for me to predict exactly how much food is going to be eaten in my household over a regular week	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
V.Stefan et al.2012		I'm able to cook and prepare exactly the amount of food that my household needs	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
V.Stefan et al.2012		I'm able to buy exactly the amount of food that my household needs	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree

		18	MORAL ATTITUDE						
Hamilton,Denniss and Baker (2005)		Throwing away food does not bother me	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
Hamilton,Denniss and Baker (2005)		When I throw away food I feel guilty	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
		19	AWARENESS						
V.Stefan et al.2012		I know exactly how much food we throw away every day	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
V.Stefan et al.2012		I know exactly what kind of food we throw away	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
V.Stefan et al.2012		I am aware of how much money I pay weekly for food that gets thrown away	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
Brook Lyndhust (2007); Exodus (2007)		Food waste is not a problem for the environment as it is natural and biodegradable	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
V.Stefan et al.2012		The fact that I waste food does not affect the undernourished people in the world because anyway I could not give that food to them	strongly disagree	disagree	somewhat disagree	neither agree or disagree	somewhat agree	agree	strongly agree
		20	FOOD INVOLVEMENT						
V.Stefan et al.2012		How would you rate your general involvement with food?	not at all involved	low involved	somewhat involved	neutral	moderately involved	involved	high involved
		21	FREQUENCY OF SHOPPING						
Brook Lyndhust (2007)		How often do you usually do your main shopping trips?	daily	2-3 times per week	once a week or less often				
Brook Lyndhust (2007)		How often do you usually do smaller "top up" shopping trips?	daily	2-3 times per week	once a week or less often				