



FOOD WASTE

Janneke Geerken - i6255726

Claire van der Heijden - i6229141

Mylene Eenkhoorn - i6264494

TABLE OF CONTENTS



01

Introduction

02

**Causes &
stakeholders**

03

Scenario planning

04

Recommendation

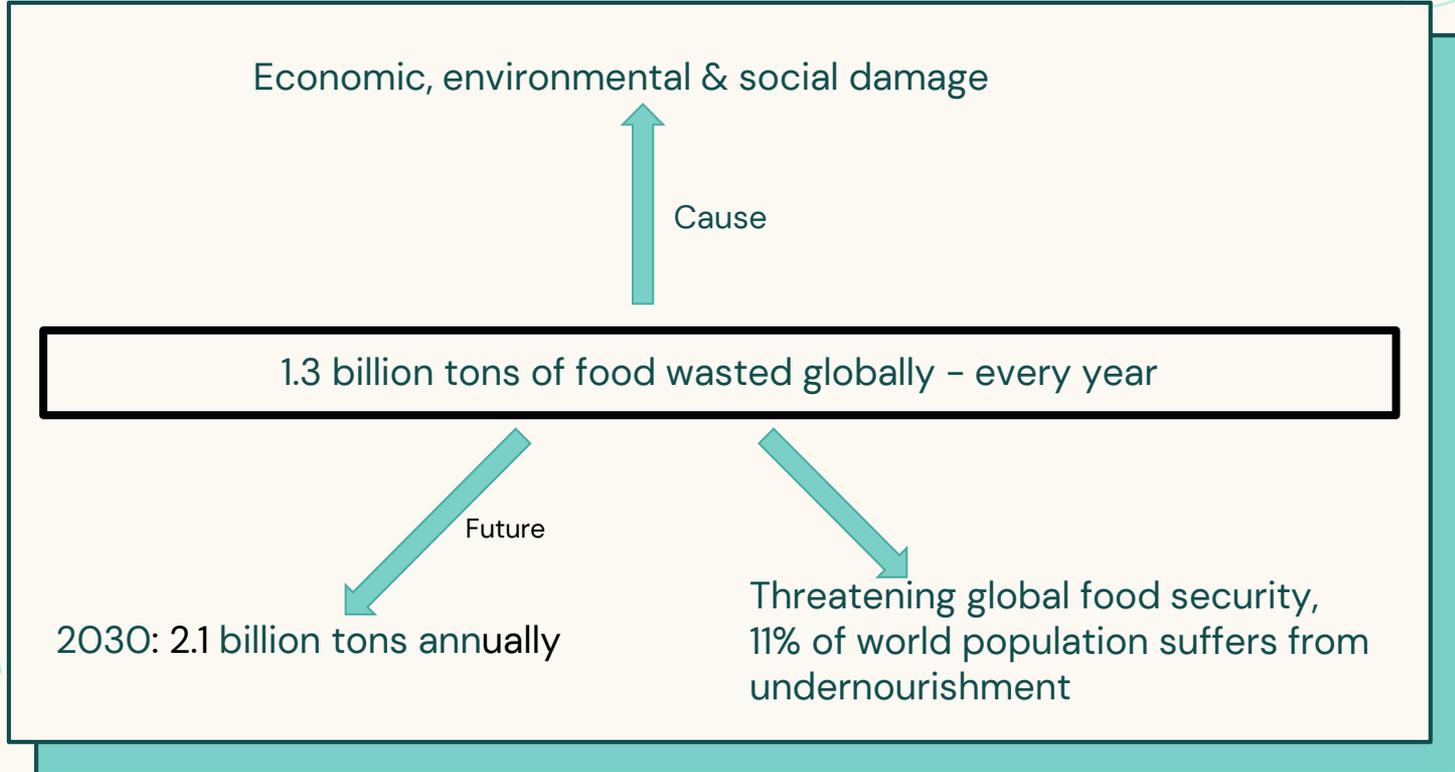


01

Introduction



Problem



Developed countries - main causes of food waste
food generation & consumer behavior



Consumer behavior - $\frac{1}{3}$ total food waste
Changing food waste behavior - significant reduction



EU level:
2020 - 57 million tonnes
Household - 55% (31 million tonnes)



SDG 12

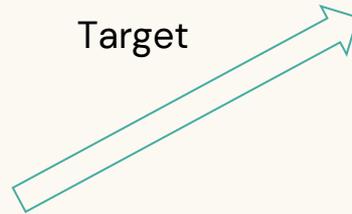
50% reduction -2030



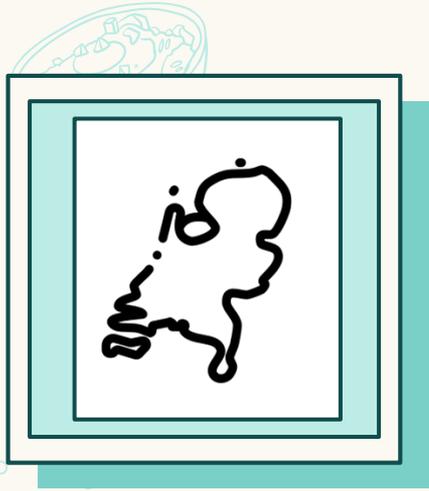
12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



Target



Research focus



The Netherlands

5th in EU – most food waste
Total – 2.8 million tonnes
Households – 1 million tonnes
per year



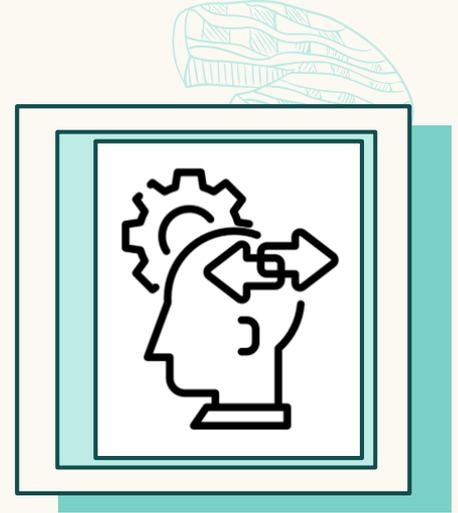
2010: 66.7 kg
2019: 52.1 kg



Household composition

Household level

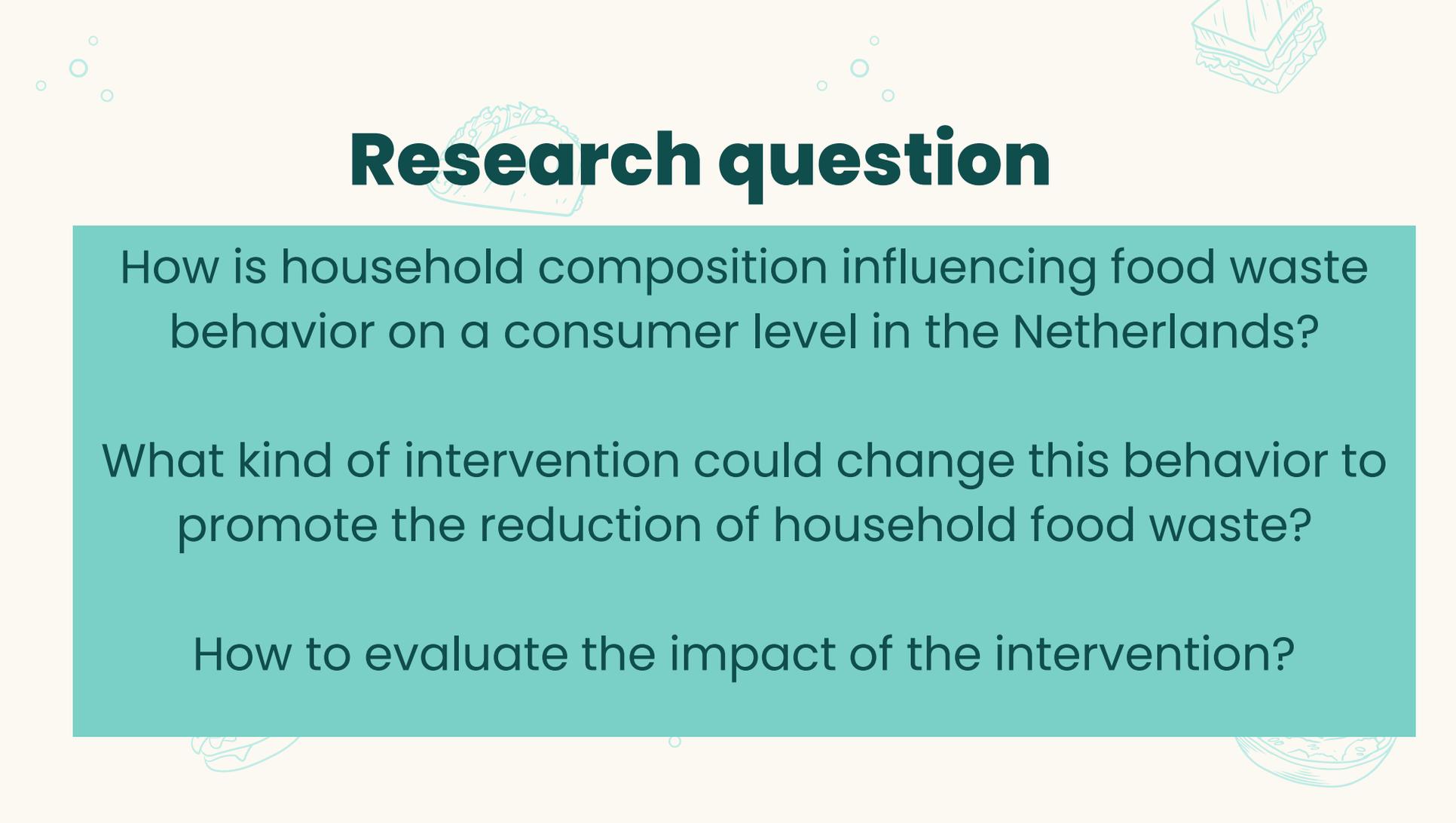
Family with more children



Behavior

(Statistics Explained, n.d.)(Kansal et al., 2022)
(Voedingscentrum, 2020)





Research question

How is household composition influencing food waste behavior on a consumer level in the Netherlands?

What kind of intervention could change this behavior to promote the reduction of household food waste?

How to evaluate the impact of the intervention?



02

Causes & stakeholders



Household food waste journey

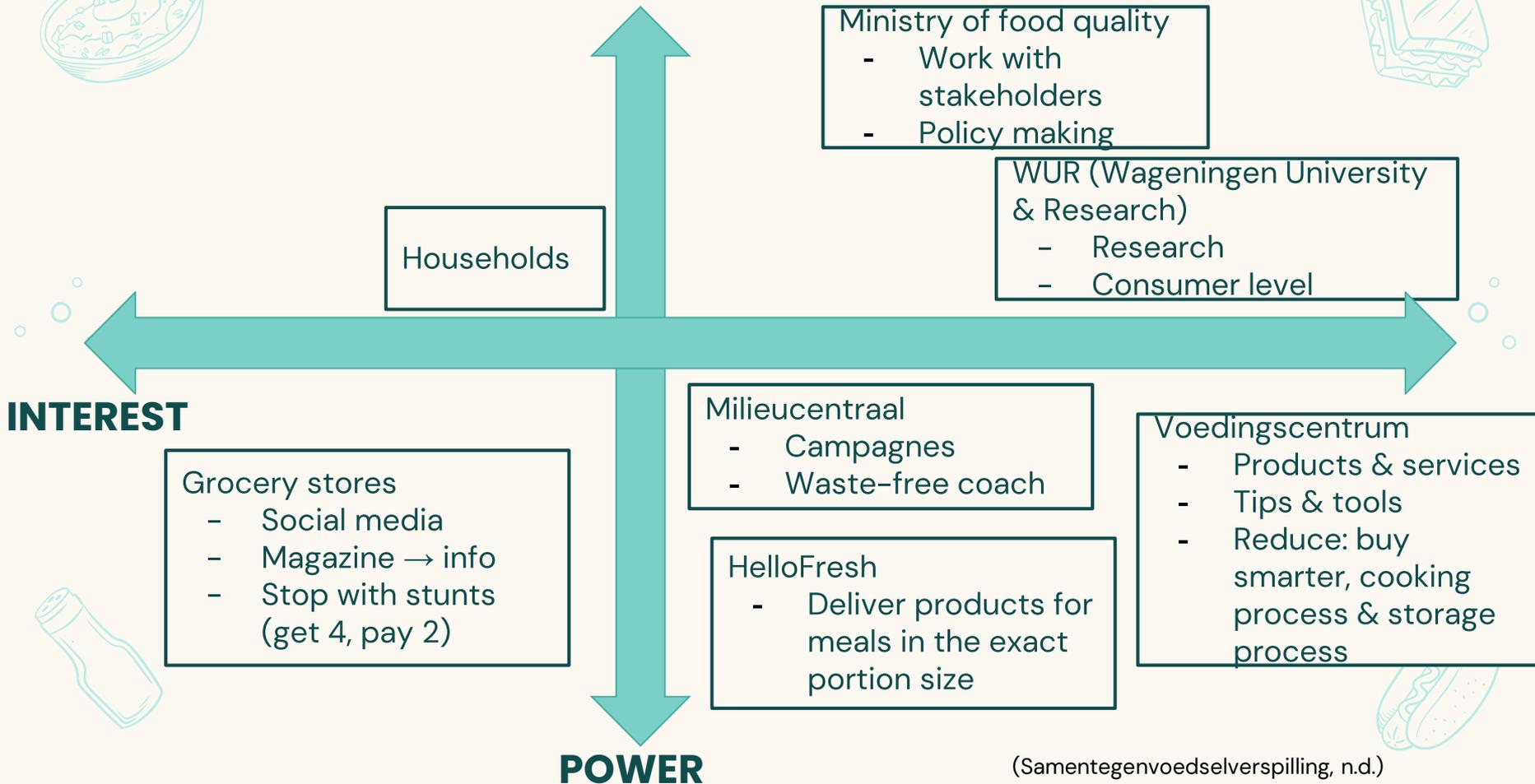


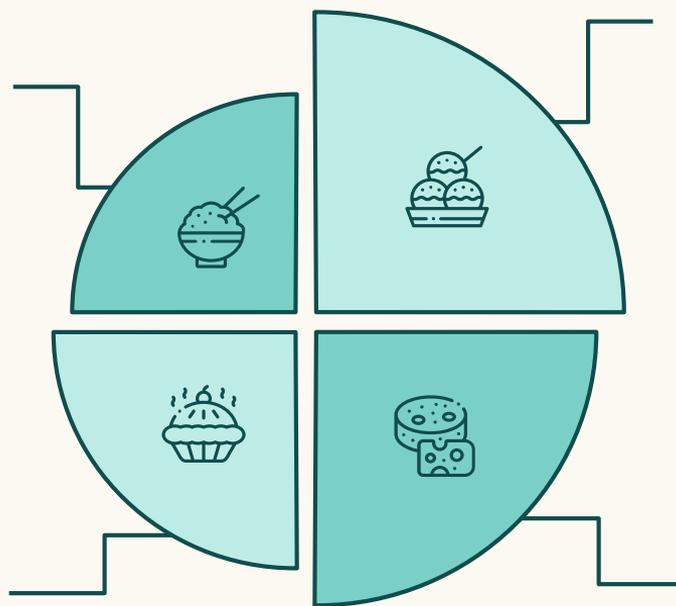
Psychological Factors	Norms	Situational Factors	Demographics and SES factors
<ul style="list-style-type: none">• Attitudes• Perceived behavioural control• FW Knowledge• FW involvement• Habits, emotions	<ul style="list-style-type: none">• Social norms• Personal norms	<ul style="list-style-type: none">• Level of Urbanization• Perception of the amount of litter	<ul style="list-style-type: none">• Age• Level of education• Household composition• Gender• Income



Figure 1 - Household wasteful behavior framework. *Note.* Reprinted from The household wasteful behaviour framework: A systematic review of consumer food waste, by Principato et al., (2021), Industrial marketing Management Volume 93, 2021, Pages 641-649, ISSN 0019-8501, <https://doi.org/10.1016/j.indmarman.2020.07.010>.

Stakeholders household food waste





03

Scenario planning



Driving forces



Climate change

Population growth

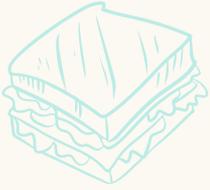
Scoping

Micro-level





Uncertainties





Systematic literature research



Technology

'intervention' AND 'technology'
AND 'apps' AND 'reduce food
waste' AND 'household
composition with children' AND
'Europe'



6 studies

Knowledge

'intervention' AND 'knowledge' AND
'skills' AND 'reduce food waste' AND
'household composition' AND 'Europe'
'food waste', 'families', 'information-
based interventions'



7 studies



Case study

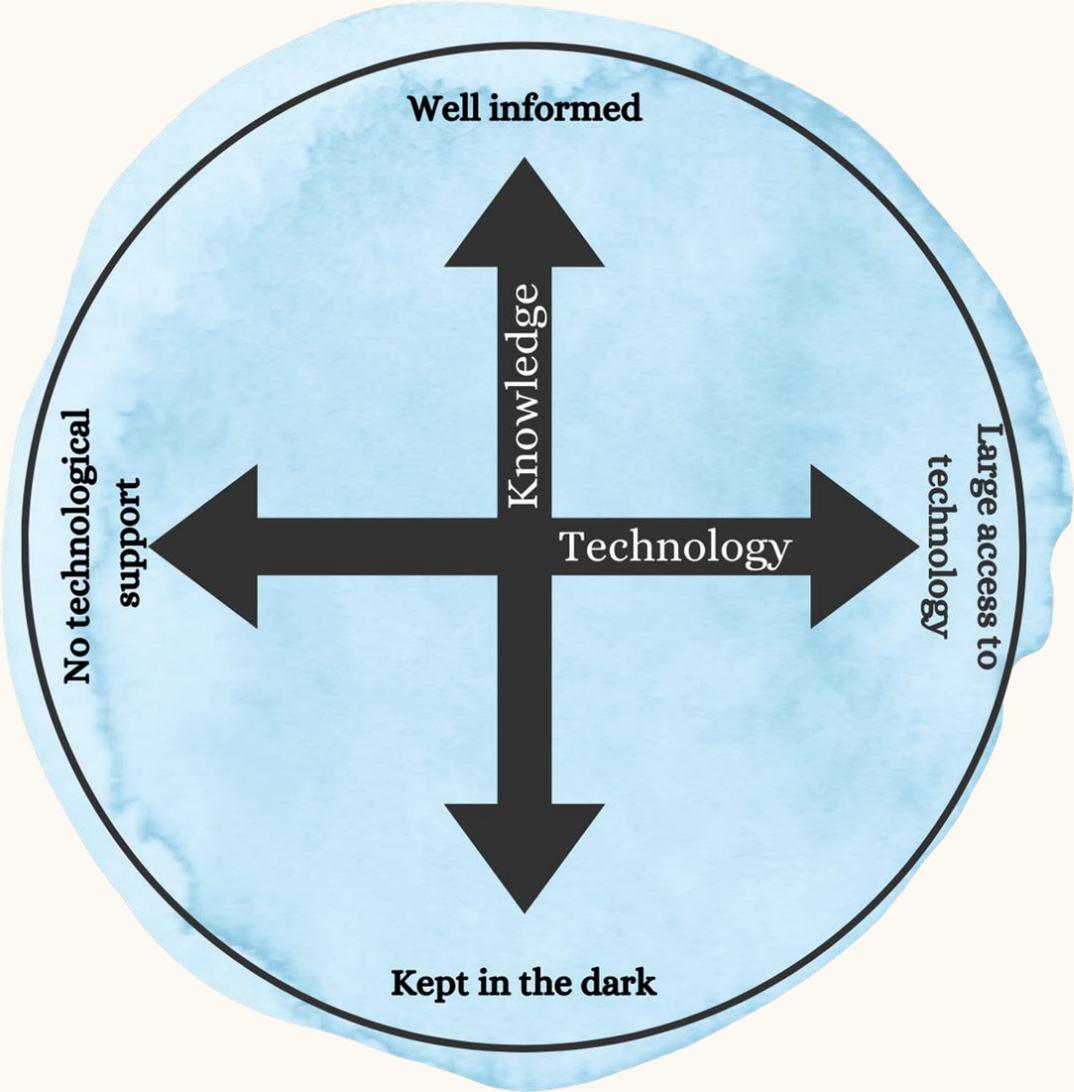


	HomeLab Framework	Week 1: Concretisation Baseline data collection & establish understanding of current eating habits & practices	Week 2: Acquisition Connect to food production, raise awareness of environmental impact of food choices & grow your own	Week 3: Storage & Preparation Educate about optimum storage conditions, engage in portion control, inspire new meal ideas & plan meals	Week 4: Food Waste Recovery Raise awareness of impacts of food waste, promote waste hierarchy, & compost unavoidable waste
Governance	Practice Dimension Targets and guidelines set each week	No interventions	Carbon Targets	Food Safety Guidelines	Brown Bin Regulations
Tools	Products Tools, technology and new food options that may facilitate more sustainable food shopping, cooking and disposal	No interventions	Organic Fruit and Veg Box (delivered to each home)		
			Home Aquaponics Kit	Fresh Storage Devices	Electronic Composter
			Meal Planning Website	Fridge Triage Box	Bin Odour- and Fly-Reducing Spray
			Compostable Food Waste Boxes	Portion Control Tools	Protein 3: Vegetarian Options
			Protein 1: Organic Meats	Magnetic Shopping List	
				Protein 2: Sustainable Fish	
Education	Information & Inspiration Behavioural guidance and motivational events	Future Kitchen Visions	Food Seasonality	A-Z Storage Guide	Food Waste Hierarchy
			Shopping Infographic	Personal Chef Visit	Economics of Waste
			Farmer's Market Encouragement		Home Composting Guides



(Devaney et al 2017)

Scenario framework



Scenario development

Low hanging fruit

Households are provided with knowledge on the environmental impact of their waste and on how to reduce it through government campaigns and social media. They have high knowledge (or knowledge is increasing) about the environmental and economic consequences of their food waste behavior but are not using technologies to support their behavior. The households try to behave based on their current knowledge about food waste and are contributing in small steps to reducing it.

Progressive pears

The government provides information to households making them aware of the effects of food waste on climate change, their contribution to the problem and how this contribution can be lowered. The households own good quality storage options, make use of gadgets such as FridgeCams and know how to properly use the technology. They are making use of applications that make reducing food waste convenient. The households are changing or have changed their behavior and are contributing a lot to food waste reduction.

Unknowing onions

Households are not aware of their food waste behavior or they do not care about the environmental and economic impacts of their behavior. They are wasting a lot of food, and thereby also wasting money. There is not a lot of technological development to make reducing food waste more convenient and households are not aware and skilled to use the tools they have at home. Negative effects on the climate due to food waste will not be noticeable in the Netherlands in the short future, so without information and support these households will continue behaving as they do.

Tech tomatoes

Households are using technology such as food management applications or smart fridges because they can afford it and are influenced by their social networks. In addition, households are using technology because the children think it is cool and futuristic and the parents could have a financial stimulation by using all the food products and not throwing them out. However, households are not aware of their behavior and how food waste is contributing to environmental and economic problems. Their behavior is mitigated through the use of technology.



Analysis of the scenarios



Scenario 1

Low hanging fruit

- High knowledge, low technological support
- No major behavioral changes expected
- Medium impact on food waste reduction
- Providing information is estimated to have medium expenses for the government
- Economic cost is estimated to be moderate
- Low to medium environmental cost
- Some extent contribute to reaching SDG 12.3

Scenario 2

Progressive peers

- High knowledge, high technological support
- Expected change in food waste reduction behavior
- High impact
- Economic costs are expected to be moderate to high
- Environmental cost is expected to be moderate
 - Technological use
- Moderate to high contribution to reaching SDG 12.3

Scenario 3

Tech tomatoes

- Low knowledge, high technological support
- Technology is replacing the uncertainty of knowledge
- Moderate impact on food waste reduction behavior
- Economic cost is estimated to be moderate
 - Use of technology
- Low to medium environmental impact
 - Some reduction of food waste
- Contributes to reaching SDG 12.3

Scenario 4

Unknowing onions

- Low knowledge, low technological support
- No behavioral changes expected
- Low impact on food waste reduction
- Economic cost is estimated to be low to medium
 - No intervention, same behavior
- High environmental cost
 - No reduction in food waste
- No significant contribution to reaching SDG 12.3

Scenario: Progressive pears

High impact towards reducing food waste

Moderate to high economic costs

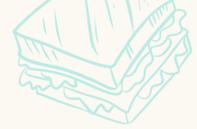
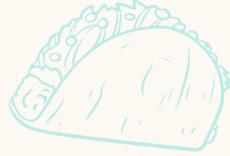
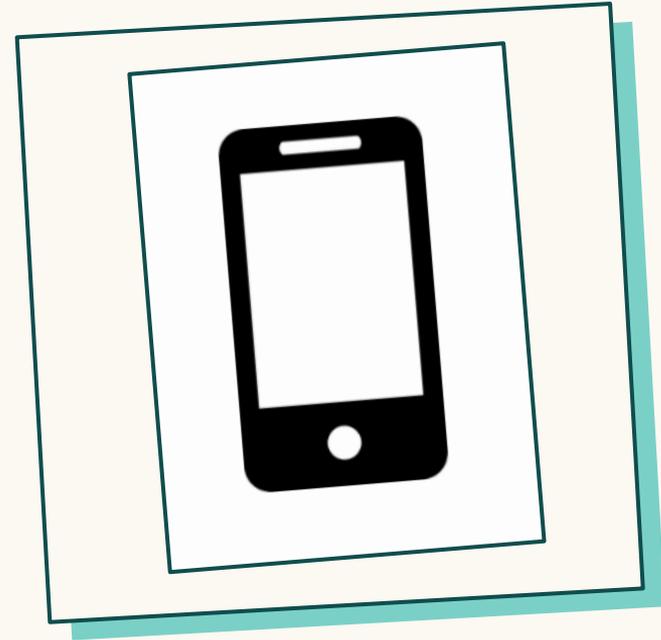
Impact on environment dependent on application

Moderate to high contribution to reaching goal
12.3



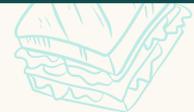
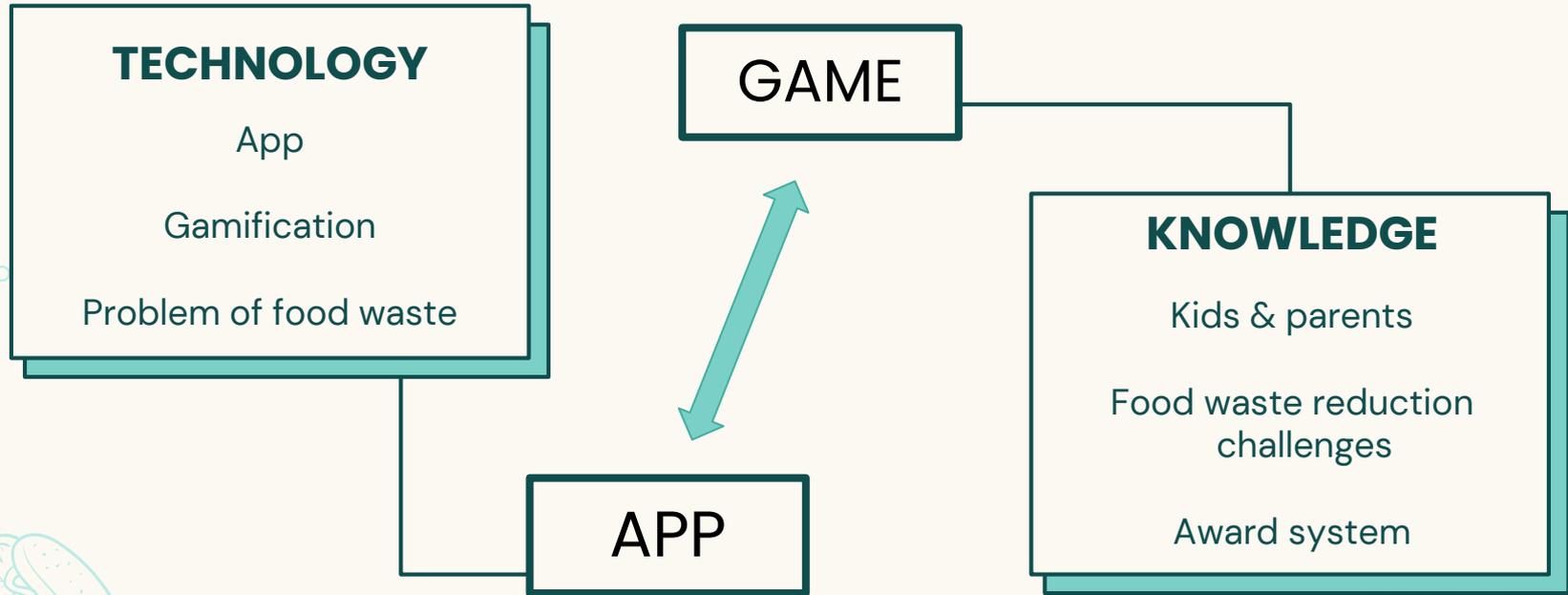
04

Recommendation





Combining knowledge and technology!



App - content



CREATE AWARENESS

Games

Reflection feature:

*what is the largest food product
you have thrown away this week?*

Was this necessary?

GAMES

Make box with food products that
have a shelf life of one week

Cook this recipe with leftovers

Store - what goes in the fridge or
in the cabinet?

Quiz - true/false questions

REWARDING SYSTEM

Awards

Collect badges

FOOD AGENDA

Keep track of your expiring food





Limitations



- 2 factors
- Data collection



Future research

- Effect of technology on food waste reduction in the long term (impact)
- Household composition and the difference with children in food waste
- How many children, one or two parent households
- Practical data on the effect of knowledge interventions on food waste reductions
- Waste composition analysis on different behaviour factors





References (1)



Aydin, A.E., Yildirim, P. (2021). Understanding food waste behavior: The role of morals, habits and knowledge, *Journal of Cleaner Production*, Volume 280, Part 1, 2021, 124250, ISSN 0959-6526, <https://doi.org/10.1016/j.jclepro.2020.124250>

Calvo-Porrall, Cristina & Faina, Andres & Lopez, Chema. (2016). Can Marketing Help in Tackling Food Waste?: Proposals in Developed Countries. *Journal of Food Products Marketing*. 23. 42-60. 10.1080/10454446.2017.1244792

Devaney, L., & Davies, A. R. (2016). Disrupting household food consumption through experimental HomeLabs: Outcomes, connections, contexts. *Journal of Consumer Culture*, 17(3), 823–844. <https://doi.org/10.1177/1469540516631153>

Kansal, M., Jayanath, A., Mitsis, A., Karunasena, G.G., Pearson, D. Food waste in households: Children as quiet powerhouses, *Food Quality and Preference*, Volume 98, 2022, 104524, ISSN 0950-3293, <https://doi.org/10.1016/j.foodqual.2021.104524>

Oliveira, A. (2021). Food waste, let's talk about consumers. Zero Waste Europe. <https://zerowasteurope.eu/2020/06/food-waste-lets-talk-about-consumers/>





References (2)



Principato, L., Mattia, G., Di Leo, A., Pratesi, C.A. (2021). The household wasteful behaviour framework: A systematic review of consumer food waste, *Industrial Marketing Management*, Volume 93, 2021, Pages 641-649, ISSN 0019-8501, <https://doi.org/10.1016/j.indmarman.2020.07.010>

Statistics Explained. (n.d.).

https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Food_waste_and_food_waste_prevention_-_estimates

Samen Tegen Voedselverspilling | Bedrijven. (2022). Samen Tegen Voedselverspilling.

<https://samentegenvoedselverspilling.nl/bedrijven/>

United Nations. (2015). Sustainable development goals: 17 goals to transform our world. *United Nations*, [Online]. Available:

<https://www.un.org/sustainabledevelopment/energy/>

Voedingscentrum. (2019). Synthesis report on Food Waste in Dutch Households in 2019. In Voedingscentrum.nl

Statistics Explained. (n.d.).

https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Food_waste_and_food_waste_prevention_-_estimates





Questions?

