DietWise
SYSTEMIC CHANGES | EMPOWERED CITIZENS

Deliverable 3.1.

Report on social influence and norms interventions

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This work is dedicated to the memory of Justina Baršytė, author of the DietWise project idea, whose vision and commitment were invaluable to this project

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Abbreviations

Statistical Abbreviation	Full Form
β	The standardized (regression) coefficient refers to how many standard deviations a dependent variable will change, per standard deviation increase in the predictor variable.
M	Mean
SD	Standard deviation
N	Sample size
p	is the probability of obtaining results at least as extreme as the observed data, assuming that the null hypothesis is true.
w	Effect Size for Chi-square tests.
Wilks' Λ	Wilks' Λ represents the proportion of variance in the dependent variables not explained by the independent variable; smaller values indicate a stronger multivariate effect.
F	The F statistic reflect the ratio of between-group variance to within-group variance and indicates whether observed group differences are larger than would be expected by chance.
partial n^2	Partial n^2 represents the proportion of variance in the dependent variable(s) explained by a given independent variable, controlling for other effects in the model.
r	Pearson's r measures the strength and direction of the linear relationship between two continuous variables
Abbreviation	**Full Form**
EU	European Union
KPIs	Key Performance Indicators
M#	M followed by a number refers to the specific project month
WP#	WP followed by a single digit number refers to a specific Work Package

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1. Summary

This deliverable reports on the results of WP3 – *Developing behavioural interventions to boost the motivation for adopting beneficial tools and applications*. The objective of WP3 is to develop and pre-validate a package of effective behavioural interventions that increase citizens' motivation to adopt ICT tools supporting healthier and more sustainable nutrition-related choices, while accounting for contextual and individual differences.

The work comprised four interrelated tasks. First, a structured review of meta-analytic evidence and existing practices in the pilot countries was conducted to identify behavioural interventions based on social influence and social norms with demonstrated effectiveness in health and sustainability contexts. These interventions were complemented with newly designed techniques tailored to nutrition guidelines and strategies aimed at reducing resistance to behaviour change. All candidate interventions were pretested in controlled lab and online settings, including assessments of effect sizes, statistical significance, replicability, and suitability for transmission via different types of influences.

Second, the effectiveness of behavioural interventions was systematically examined across contextual and socio-cultural moderators, including nationality, religion, culture, regionality, and seasonality. This analysis identified conditions under which interventions are boosted, suppressed, or risk backfiring, resulting in a matrix mapping intervention effectiveness across different contextual profiles.

Third, behavioural interventions were tested for their capacity to promote waste reduction and more sustainable delivery choices in nutrition-related contexts. Following evidence synthesis and experimental testing, the most effective interventions were identified for different waste and delivery scenarios.

Finally, the accessibility of behavioural interventions for vulnerable groups was evaluated using the 8Bs methodology, assessing affordability, usability, reliability, comprehensibility, understanding, availability, and familiarity.

Overall, this deliverable provides a set of novel, motivationally matched behavioural interventions that boost citizens' motivation to use nutrition guidelines in everyday cooking, directly contributing to the project's Objective O2: Boosting motivation to use nutrition guidelines for cooking with novel behavioural interventions. By systematically testing norms-based and social influence interventions and aligning them with citizens' intrinsic motivations, socio-cultural contexts, and practical constraints, the work operationalizes a holistic approach integrating culinary culture, nationality, regionality, seasonality, time and financial constraints, as well as waste reduction and delivery choices. The validated intervention package and effectiveness matrix support the selection of at least three high-impact interventions for real-life validation in WP6 (KPI-7) and create the conditions for measurable improvements in motivation to cook in a sustainable and healthy way (KPI-9) and compliance with recipe corrections (KPI-22). These findings provide actionable guidance for designers of digital nutrition tools, policymakers, and practitioners by demonstrating how short, low-cost persuasive messages embedded in recipes can be scaled to effectively promote healthier and more sustainable ingredient choices, including among time- and resource-constrained consumers.

2. Background

2.1 The DietWise project

The mission of DietWise is to tackle the pressing challenges of unhealthy and unsustainable eating habits by empowering individuals to make informed, healthier, and environmentally conscious food choices. The project seeks to enhance the uptake of beneficial tools and applications, improve food literacy, and promote healthy and sustainable diets. The project focuses on systemic changes, inclusion, and social innovations in food practices. The main goals are to address unhealthy and unsustainable food consumption by developing innovative approaches that streamline existing tools and applications. Key innovations include the Responsible Cooking Alliance, a voluntary reporting system for influencers and food environment actors, and RecipeWatch, an AI-powered app that suggests personalized corrections to online recipes to align with nutrition guidelines.

2.2 Task 3.1: Developing behavioural interventions to boost the motivation for adopting the beneficial tools and applications

2.2.1 Scope and Specific Objectives

In the context of the DietWise project, WP 3 aims to develop behavioural interventions that would boost the motivation for adoption of healthy and sustainable nutritional recommendations in the RecipeWatch application. This task focuses on social norms and other social influence techniques, such as alpha and omega strategies.

The specific objectives of Task 3.1 are summarized as follows:

- Brief literature review to identify potential behavioural interventions using social influence and social norms.
- Testing interventions in lab/online settings
- Testing the boosting vs. suppressing (moderating) role of nationality, religion, culture, regionality, and seasonality
- Brief literature review identifying the behaviours linked to waste reduction and delivery choices
- Matching the behavioural interventions with the motivation for reducing waste and delivery choices
- Evaluation of the accessibility of the behavioural interventions for vulnerable people

2.2.2 Linked KPIs

Table 1. Key performance indicators

KPIS	Key performance indicators
KPI-4 *	Designing and testing behavioural interventions: 22 lab/online/field experiments ≥10.000 responses.
KPI-7 *	Developed and tested innovative behavioural interventions: at least 3;
KPI-8 *	Methodology listing the most efficient interventions: 1;

2.2.3 Timeline

Table 2. Timeline

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16
Literature review																
Intervention assessment by experts																
Preparation of recipes and recommendations																
Pilot studies																
Megastudy in UK																
Analysis & Reporting																
Planning of data collection in the Pilot countries																

3. Methodology & procedure

Prior research has primarily tested isolated interventions instead of systematically comparing multiple approaches across diverse consumer groups. Consequently, this has led to fragmented empirical findings that limit the development of robust, scalable strategies for promoting healthier and more sustainable diets. To overcome this limitation, we conducted a megastudy – a large-scale experiment that simultaneously tested the effectiveness of multiple interventions in the same population, on the same outcomes, and over the same duration (Milkman et al., 2021). The megastudy methodology is chosen as a superior research method to an alternative method, such as meta-analysis, which is limited by differences in experimental scenarios, measured dependent variables, sample sizes, and operationalizations (Vlasceanu et al., 2024). The megastudy approach provides a unified framework that allows for transparent reporting, including null results, and clear identification of the interventions with the highest expected value for addressing a pressing policy problem. In our case, this means pinpointing which norms, alpha, and omega social influence techniques most effectively increase consumer acceptance of healthier and more sustainable recipe recommendations, and for which consumer segments these effects are strongest. Social norms refer to typical behaviours and signal which behaviours are most popular (Cialdini, Reno & Kallgren, 1990; Schultz et al., 2007; Melnyk et al., 2022). This message can help individuals align their behaviours with what they perceive as the norm, fostering a sense of social conformity and acceptance. Alpha influence techniques attempt to persuade consumers by increasing approach forces, while omega techniques aim to decrease avoidance forces, in other words, reducing reluctance to change (Knowles & Linn, 2004).

To fine-tune our experimental scenario, we set up 3 pre-test studies that experimentally evaluated different recipes, recommendations for their improvement, and several interventions with a smaller sample size and for a shorter period of time. Findings obtained during the pre-testing informed the final setup of the megastudy design and procedure, informing us which recipes to choose, how to set up the study, and whether our dependent variables are sensitive enough to capture any effects. At the end of this task, we were able to create a final megastudy scenario (see Appendix 1), make sampling decisions, and set up the data collection period.

The first wave of Megastudy data was collected in the United Kingdom using the Prolific Academic online sample, N = 2500. Further data collection will be carried out in Lithuania, Greece, and Belgium using a panel provider. We aim to collect approximately 2500 participants in each country. This is in line with our related KPI-4*: Designing and testing behavioural interventions: 22 lab/online/field experiments ≥10.000 responses.

3.1 Megastudy preparation procedure

The megastudy was prepared in accordance with best practices for randomized controlled trials conducted in online environments (Duckworth & Milkman, 2022). The preparatory phase of the megastudy consisted of two foundational benchmarks: (i) the identification of high-impact social influence and social norms interventions, and (ii) the curation of recipe stimuli selected for their alignment with sustainable and healthy dietary guidelines. Specifically, the main research procedure was to present participants with a recipe that included a recommendation to substitute one ingredient with a more sustainable and healthier alternative, or reduce the amount of a less healthy ingredient. This recommendation was either accompanied by the assigned social influence or social norms–based intervention or presented without any additional intervention (see Section 4.2).

3.2 Description of social influence and norms intervention selection procedure

First, an extensive literature review on social norms, alpha, and omega social influence strategies was carried out. This allowed us to collect a list of 34 social norms, 51 alpha, and 67 omega influence intervention techniques, which were further organized into distinct technique categories: four categories of social norms techniques, eight categories of alpha techniques, and eight categories of omega techniques. Second, the eligibility of each intervention was assessed based on pre-defined criteria (see Table 3). Interventions that did not comply with the criteria were removed from further analysis.

Table 3. Intervention Assessment Criteria

No.	Assessment criteria	Description of criteria	Evaluation
1	Length of the intervention	Is the intervention no more than 12 words	Yes/No

2	Clarity	Is the intervention text simple and understandable (no double negation, no complicated reasoning, no subclauses, no reference pronouns)?	Yes/No
3	Flexibility	Can the intervention be adapted to different contexts (e.g., with different recipes and recommendations, in different placements)?	Yes/No
4	Redundancy	Is this intervention similar to other interventions?	Yes/No
5	Single point of influence	Does this intervention require single exposure? (Exclude interventions that require repeated exposure.)	Yes/No

This enabled us to identify a reduced set of suitable interventions for further evaluation: 15 social norms, 17 alpha, and 19 omega techniques (51 interventions in total). This list was sent to behavioural research scientists for an evaluation. Scientists were asked to rate the expected impact of each social norms, alpha, and omega social influence intervention on a seven-point scale (1 = *very low impact*; 7 = *very high impact*).

Next, we conducted a non-parametric statistical test (the Friedman test) to rank interventions within each technique category. The results reflected the average relative standing of each intervention across all experts: in general, the intervention with the highest mean rank was the one most consistently rated highest relative to the others. Because Social Norms interventions were organized into four distinct technique categories, we selected the highest-ranked intervention from each category, resulting in four Social Norms interventions. We then applied the same procedure to the Alpha and Omega strategies, selecting the top-ranked intervention within each of their eight respective categories. This resulted in a final set of 20 interventions (The Friedman test results and the final set of interventions are presented in Appendix 4).

Also, the same list of interventions was sent out to the expert Caroline Coeckelberg at our consortium partner, the VIGL, Vlaams Instituut voor Gezond Leven (Flemish Institute for Healthy Living), for evaluation of the accessibility of behavioural interventions for vulnerable people. VIGL specialist was asked to evaluate the applicability of the 8B dimensions of accessibility on a series of proposed interventions. Specifically, she was asked to provide their expert rating by answering" How well does this intervention align with the specific 8Bs dimension? 1= *not at all aligned*; 5 = *very well aligned*". 8 B dimensions included: usability, affordability, reliability, availability, reachability, comprehensibility, publicity, and empathy (see Appendix 2 for the full questionnaire). An expert indicated that the Affordability and Availability dimensions were not applicable (or not feasible to assess for most of the messages) because they are very subjective. For a full analysis, please see Appendix 3.1-3.3.

3.3 Recipe and recipe recommendation selection procedure

To ensure high ecological validity and cross-cultural relevance, the recipe recommendations were developed through a structured co-creation process with sustainable and healthy diet experts in our consortium. This collaborative approach served two primary objectives: first, to ensure participant familiarity with the culinary content; and second, to align all sustainability recommendations with

established healthy and sustainable diet guidelines. To achieve this, Consortium Partners were invited to participate in a co-creation activity. Experts from the Vilnius City Public Health Bureau (Lithuania), the Flemish Institute for Healthy Living (Belgium), and the International Hellenic University (Greece) took part in structured discussions to identify a repository of recipes with high cross-national familiarity, as well as specific recommendations targeting the most critical challenges in healthier and more sustainable cooking. Following the consultation phase, partners utilized a standardized validation form to select the most impactful recommendations based on predefined criteria (see Table 4).

Table 4. Recipe Recommendation Selection

Your recommended final list of the courses		
Please note that these six courses cover all five healthier and more sustainable eating recommendations		
Please select 6 courses from the list you would suggest to use • Pasta Bolognese • Pancakes • Cookies • Omelets and scrambled eggs • Banana bread • A classic chicken sandwich • Scrambled eggs • Soup or stew • Greek salad • Oatmeal • Muffins • Granola • Salad dressing • Pastitsio • Mousakas	Which one of the five healthier eating recommendations does the recommendation address? (Choose from the list) • whole grain • unsaturated fatty acids • less salt • reduce empty calories • less meat	Which one of the five more sustainable eating recommendations does the recommendation address? (Choose from the list) • animal welfare • less meat/ dairy products -> into plant-based • seasonal and local vegetables/ fruits • less processed • planning, avoiding waste

Following this iterative co-creation process, a final list of six recipes and their corresponding recommendations was developed (see Table 5).

Table 5. List of Selected Recipes & Recommendations

	Recipe	Healthy and Sustainable Recommendation
1	Chicken Potato Casserole	Cut the meat by half and add 400g of seasonal and/or locally grown vegetables (e.g., two zucchinis and 2 bell peppers) instead
2	Easy Spaghetti Bolognese	Reduce beef by half and add lentils instead
3	Vegetable Soup	This recipe includes bouillon cubes that are typically very salty. Start with ½ teaspoon salt or omit it all together
4	Frittata Recipe (Easy Oven Method)	Use soy or any other available plant – based whipping cream instead of dairy based cream.
5	Carrot Pancakes	Use 2 cups of whole wheat flour instead of white wheat flour

6	Banana Bread	If you use overripe bananas, they will be sweeter, so you can reduce the amount of sugar

After selecting the most validated recipe recommendations, three pilot studies were conducted to pretest a series of experimental manipulations. This process enabled refinement of both the recipes and the associated recommendations. Findings from the pretesting informed the final megastudy design and procedures, including decisions on recipe selection, study setup, and the sensitivity of the dependent variables to detect meaningful effects.

3.3.1 Pilot Study 1: Pretesting recipes and recommendations for recipe improvement

The first pilot study aimed to evaluate a set of recipes for use in subsequent megastudy. Participants were presented with six recipes, each accompanied by a recommendation designed to encourage the selection of healthier and more sustainable food ingredients. The objectives of the pilot were to select a recipe recommendation with a moderate baseline acceptance rate that was sensitive to recommendations, as well as testing the experimental setup. First, regarding acceptance rate, an acceptance rate that is too low (below 20%) may indicate that the recommendation lacks credibility, making it difficult to detect further increases in acceptance. Conversely, an acceptance rate that is too high (above 60%) would limit the potential for experimental interventions to produce meaningful increases in acceptance. Second, regarding sensitivity to interventions, we aimed for recipe recommendations that were sensitive to social influence and norms interventions. Based on the literature, we selected a social norm intervention (Griskevicius et al., 2009) and adapted it to our setting, "*Most app users accept this recommendation*". The study was preregistered on *AsPredicted* platform (see https://aspredicted.org/6sh3b3.pdf . Also, pilot study 1 underwent a formal ethical evaluation and received ethical approval from the Institutional Review Board according to the procedures determined in the Regulation of Vilnius University Faculty of Economics and Business Administration (VU FEBA) Institutional Review Board in the Area Consumer Decision Making.

Pilot Study 1 Design

A between-subjects experimental design was employed with two conditions: a treatment condition and a control condition. Participants were randomly assigned to one of the two conditions. In the treatment condition, participants received six recipes with recommendations accompanied by a social norm intervention. In the control condition, participants received the same six recipes with recommendations presented without the social norm intervention (see Figure 1).

Figure 1. Experimental Interventions in Pilot 1

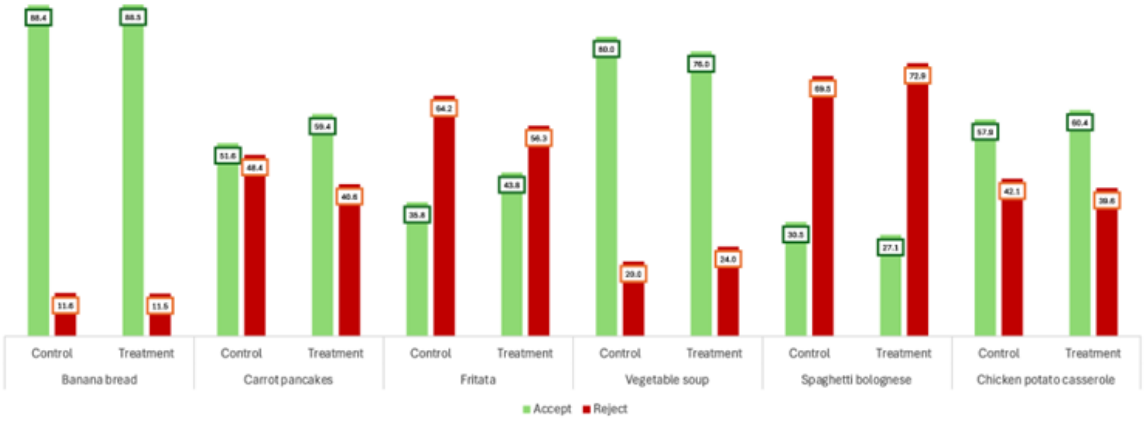
Treatment	Control
	

The primary dependent variable was participants' acceptance of each recipe recommendation, measured using a binary accept/dismiss response format. Following the evaluation of all six recipes, participants completed a set of additional related questions.

Pilot Study 1 Results

A total of 200 participants took part in the lab study at Vilnius University Faculty of Economics and Business Administration. After excluding participants who failed the attention check, 191 participants remained in the final sample (N = 96 in the treatment condition; N = 95 in the control condition, 60.6% female). The recipes were evaluated based on absolute acceptance rates (between 20% and 60%) and on differences in acceptance between intervention and control conditions, which served as the baseline reference. Ofsed on this evaluation, *Carrot Pancakes, Frittata Recipe (Easy Oven Method)*, and *Chicken Potato Casserole* exhibited moderate baseline acceptance in the control condition and were therefore deemed suitable for inclusion in the megastudy, whereas *Banana Bread* and *Vegetable Soup* showed high baseline acceptance (>60%) in the control condition, and E*asy Spaghetti Bolognese* showed high baseline rejection (>60%) in the control condition, indicating ceiling effects that would limit the potential to observe meaningful intervention effects (see Figure 2). Interventions did not have a significant effect on the acceptance of recipe recommendations. One possible explanation may be intervention text repetition – participants read the same intervention text across all recipes they were exposed to that might have led to annoyance and no effects. We aimed to correct this issue in Pilot Study 2.

Figure 2. Pilot Study 1 Results



3.3.2 Pilot Study 2: Pretesting recipes and recommendations for recipe improvement

Following a review of the results from Pilot Study 1, an additional pretest was conducted to refine and improve the experimental design. Pilot Study 2 examined whether experimental treatment (alpha, social norms, and omega interventions) had a significant impact on respondents' decision to accept recipe recommendations for 4 recipes (*Carrot Pancakes, Chicken Casserole, Frittata,* and *Spaghetti Bolognese*). The following changes were implemented based on insights from the first pilot:

- Only recipe recommendations with a moderate acceptance rate in Pilot Study 1 were retained.
- Three additional social-influence interventions that gained the highest expected impact evaluations by behavioural scientists were added to the treatment condition. As a result, participants were not exposed to the same social-influence intervention repeatedly; instead, each recipe recommendation in the treatment condition was paired with a different social-influence message.
- Recipe recommendations were shortened, retaining only the essential numerical information or ingredient suggestions. The visual design was simplified by removing color elements.
- Recipes and intervention conditions were randomly assigned and displayed, such that each participant was randomly presented with four different recipes corresponding to different intervention conditions.

The study was preregistered on *the AsPredicted platform (https://aspredicted.org/ux2ue4.pdf)*, underwent a formal ethical evaluation and received ethical approval from the Institutional Review Board according to the procedures determined in the Regulation of Vilnius University Faculty of Economics and Business Administration (VU FEBA) Institutional Review Board in the Area Consumer Decision Making.

Pilot Study 2 Design

A within-subjects experimental design was employed. Each participant was randomly presented with four recipes, with each recipe randomly paired with one of the three intervention conditions: social-norm, alpha, omega, and a control condition. We selected a commonly used strategy from each type based on the literature (Cialdini & Trost, 1998; Goldstein et al., 2008; Knowles & Linn, 2004). As a result, each participant was exposed to four different recipes, each aligned with a different intervention condition or control. The full list of experimental intervention conditions is presented in Table 4, and several design examples are provided in Appendix 5.

Table 6. Experimental interventions in Pilot study 2

Recipe	Recommendation	Intervention condition	
Chicken Potato Casserole	*Instead of 800g of chicken breasts, use 400g of chicken breasts and 400 g of vegetables*	Alpha	A tiny tweak for a better meal – why not start with this small switch
		Omega	Why not go for the better option?
		Social norms	Join the 75% who accept this recommendation
		Control	No intervention
Easy Spaghetti Bolognese	Instead of 400g, use 200 g of beef mince	Alpha	A tiny tweak for a better meal – why not start with this small switch
		Omega	Why not go for the better option?
		Social norms	Join the 75% who accept this recommendation
		Control	No intervention
Carrot Pancakes	Instead of white flour, use whole grain flour	Alpha	A tiny tweak for a better meal – why not start with this small switch
		Omega	Why not go for the better option?
		Social norms	Join the 75% who accept this recommendation
		Control	No intervention
	Instead of dairy, use plant-based whipping cream	Alpha	A tiny tweak for a better meal – why not start with this small switch

Frittata Recipe (Easy Oven Method)		Omega	Why not go for the better option?
		Social norms	Join the 75% who accept this recommendation
		Control	No intervention

Pilot Study 2 Measures and Procedure

The primary objective of Pilot Study 2 was to pre-test and validate a selection of recipes for the subsequent megastudy. Following the methodology of Pilot Study 1, the primary dependent variable was participants' binary acceptance (accept vs. dismiss) of each recipe recommendation. After the evaluation phase, participants completed a suite of additional measures designed to capture secondary outcomes and behaviours related to food waste, plastic waste, and delivery options. These measures provide the basis for the detailed analysis of waste reduction motivation and delivery preferences discussed in Section 6 ("Motivation for reducing waste and delivery choices"). The comprehensive experimental scenario for Pilot Study 2 is available in Appendix 6.

Pilot Study 2 Results

The study analyzed responses from 150 individuals recruited via the Prolific Academic online panel. The sample was 51% male, with participants ranging from 21 to 77 years of age (M_{age}= 44.2 years).

To address the non-independent structure of the data, where each participant evaluates multiple recipes and the responses are not independent, we employed a mixed-effects logistic regression model. This approach accounts for unobserved individual-specific factors and provides robust estimates of the effects of group, recipe, and their interaction. The results showed that acceptance levels varied primarily by recipe rather than by intervention conditions.

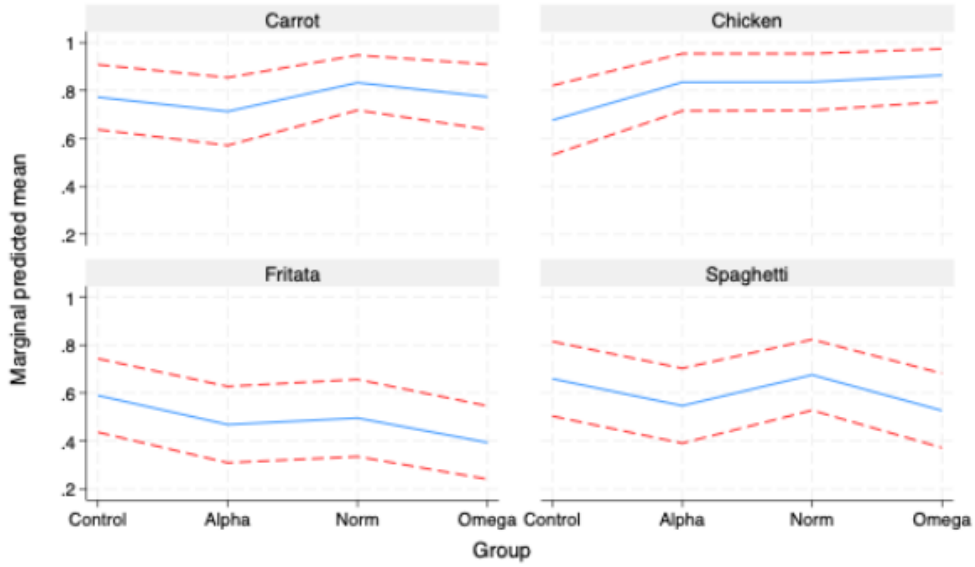
The findings indicate that the experimental messages (alpha, social norms, and omega) did not exert a significant impact on participant decisions. The experimental messages yielded different rates of recommendation acceptance, as detailed in Table 5. Messages employing social norms had the highest acceptance rate at 71%, outperforming the control condition (67.4%), alpha messages (64%), and omega messages, which had the lowest rate. Pairwise marginal comparisons indicated that acceptance rates did not differ significantly across conditions.

Table 7.Predicted probability of acceptance based on experimental messages

Group	Margin	Std. err.	z	P>z	[95% conf. interval]	
Control	0.674	0.038	17.74	0.000	0.600	0.749
Alpha	0.640	0.037	17.16	0.000	0.567	0.714
Norm	0.710	0.035	20.14	0.000	0.641	0.779
Omega	0.639	0.036	17.77	0.000	0.569	0.710

We also investigated the predicted acceptance probabilities for each recipe across various interventions (see Figure 3). The results show that predicted acceptance probabilities for the recipes varied across interventions.

Figure 3. Pilot Study 2 Predicted acceptance probabilities of recipes by intervention



For *Carrot Pancakes*, acceptance was 53.2% in the control group, 58.7% with alpha messages, and 61.9% with norm-based messages, whereas omega messages showed substantially lower acceptance (26.4%). Pairwise comparisons indicated that omega messages significantly reduced acceptance relative to the control (p = .011), alpha (p = .002), and norm-based messages (p = .001), while alpha and norm-based messages did not differ significantly from the control. For *Chicken Potato Casserole,* acceptance was 56.9% in the control group and slightly higher with alpha (63.8%), norm-based (62.8%), and omega messages (59.4%). However, pairwise comparisons showed no statistically significant differences between any intervention and the control, nor among the intervention conditions (all p > .52). In contrast, acceptance of the *Frittata* recipe was uniformly high across conditions (control: 84.2%; alpha: 83.3%; norm-based: 84.7%; omega: 76.6%). For *Spaghetti Bolognese*, acceptance was 66.6% in the control group and higher with alpha (80.4%), norm-based (74.6%), and omega messages (77.5%), with no statistically significant differences between conditions (all p > .16). The full set of pairwise comparisons of predicted acceptance probabilities between groups, by recipe, as well as the predicted acceptance probabilities of recipes by intervention, are presented in Appendix 7.

3.3.3 Pilot Study 3: Pretesting Experimental Interventions and Outcome Measures

The third pilot study was built on the results of the preceding pilots, with iterative refinements to the experimental conditions implemented at each stage. In this final pilot, minor refinements were made to the recipe recommendations related to health and sustainability.

Pilot Study 3 Design

The experimental design of the study was the same as in Pilot Study 2. However, recipe improvement recommendations were adjusted to avoid a high acceptance rate of recommendations at the control condition level (to avoid a ceiling effect). The full list of experimental intervention conditions is presented in Table 6.

Table 8. Experimental interventions in Pilot 3

Recipe	Recommendation	Intervention condition	
Chicken Potato Casserole	*Reduce the amount of chicken breast to 400g*	Alpha	A tiny tweak for a better meal – why not start with this small switch
		Omega	Why not go for the better option?
		Social norms	Join the 75% who accept this recommendation
		Control	No intervention
Easy Spaghetti Bolognese	Instead of 400g, use 200 g of beef mince	Alpha	A tiny tweak for a better meal – why not start with this small switch
		Omega	Why not go for the better option?
		Social norms	Join the 75% who accept this recommendation
		Control	No intervention
Carrot Pancakes	Instead of dairy milk, use plant-based milk.	Alpha	A tiny tweak for a better meal – why not start with this small switch
		Omega	Why not go for the better option?
		Social norms	Join the 75% who accept this recommendation
		Control	No intervention
Frittata Recipe (Easy Oven Method)	Instead of ½ tablespoon of salt, use just a pinch of salt or no salt	Alpha	A tiny tweak for a better meal – why not start with this small switch
		Omega	Why not go for the better option?
		Social norms	Join the 75% who accept this recommendation
		Control	No intervention

Pilot Study 3 Measures and Procedure

The primary dependent variable was participants' acceptance of each recipe recommendation, measured using a binary accept/dismiss response format. After evaluating all four recipes, participants completed a set of additional related questions.

Pilot Study 3 Results

The study analyzed responses from 154 participants recruited via the Prolific Academic online panel. The sample comprised 48.7% women, with ages ranging from 19 to 72 years (M_{age} = 44.5). Using a mixed-effects logistic regression model, the analysis showed that overall acceptance levels varied by recipe, while intervention effects between the control and the condition acceptance rates were largely absent, indicating that recipe-specific preferences dominated immediate acceptance responses.

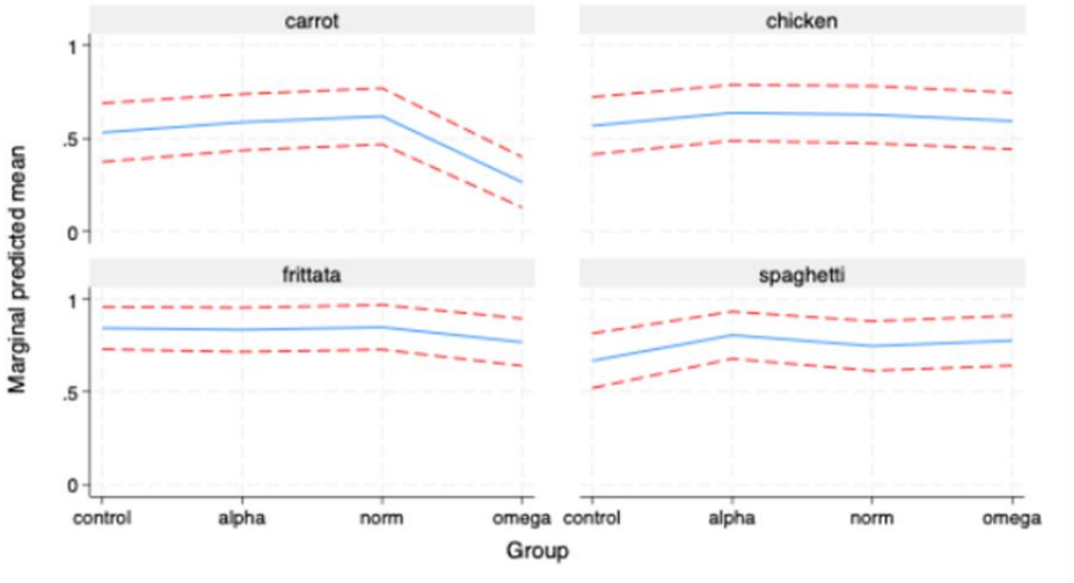
The findings indicate that the experimental messages (alpha, social norms, and omega) did not exert a significant impact on participant decisions. The experimental messages yielded different rates of recommendation acceptance, as detailed in Table 7. Messages employing social norms and alpha had the highest acceptance rate at 71%, outperforming the control condition (65.2%) and omega messages, which had the lowest rate (59,9%). Pairwise marginal comparisons indicated that acceptance rates did not differ significantly across some conditions.

Table 9. Predicted probability of acceptance based on experimental messages

Group	Margin	std. err.	z	P>z	[95% conf. interval]	
Control	0.652	0.037	17.37	0.000	0.578	0.725
Alpha	0.715	0.036	20.00	0.000	0.645	0.785
Norm	0.710	0.036	19.52	0.000	0.638	0.781
Omega	0.599	0.035	16.78	0.000	0.529	0.669

We also investigated the predicted acceptance probabilities for each of the recipes across various interventions (see Figure 4). The results show that predicted acceptance probabilities for the recipes varied across interventions.

Figure 4. Pilot Study 3 Predicted acceptance probabilities of recipes by intervention



For *Carrot Pancakes*, acceptance was 53.2% in the control group, 58.7% with alpha messages, and 61.9% with social norm messages, whereas omega messages showed substantially lower acceptance (26.4%). Pairwise comparisons indicated that omega messages significantly reduced acceptance relative to the control (p = .011), alpha (p = .002), and norm-based messages (p = .001), while alpha and norm-based messages did not differ significantly from the control. For *Chicken Casserole,* acceptance was 56.9% in the control group and slightly higher for alpha (63.8%), norm-based (62.8%), and omega messages (59.4%); however, none of these differences were statistically significant (all p > .52). In contrast, acceptance of the *Frittata* recipe was uniformly high across conditions (control: 84.2%; alpha: 83.3%; norm-based: 84.7%; omega: 76.6%), with no statistically significant differences between any conditions. For *Spaghetti Bolognese,* acceptance was 66.6% in the control group and higher with alpha (80.4%), norm-based (74.6%), and omega messages (77.5%); however, none of these differences were statistically significant (all p > .16). The full set of pairwise comparisons of predicted acceptance probabilities between groups, by recipe, as well as the predicted acceptance probabilities of recipes by intervention, are presented in Appendix 8.

4. Megastudy

4.1 Megastudy set -up

We employed a megastudy design to systematically assess the comparative effectiveness of 20behavioural interventions aimed at promoting sustainable and healthy dietary choices. This design directly addresses the objective of WP3, which is to develop a package of the most effective behavioural interventions.

In accordance with the description of Task 3.1, the interventions were theoretically grounded in established social influence frameworks. These included alpha strategies (approach-oriented), omega strategies (resistance-reducing), and social norms–based approaches.

The megastudy was designed to address the following research questions:

1. What is the relative effectiveness of the 20 interventions when compared against one another across the dependent variables?
2. Which of these 20 interventions are statistically more effective than the control condition?
3. What intervention is the most effective within social norms, Alpha, and Omega strategies?
4. Which of the three persuasion techniques is the most effective in encouraging acceptance of sustainable and healthier recommendations – social norms, Alpha, or Omega influence technique?
5.

4.2 Megastudy Design & Procedure

Participants were presented with a recipe with a recommendation encouraging the substitution of one ingredient with a more sustainable and healthier alternative. This recommendation was either accompanied by an intervention framed in accordance with the assigned social influence strategy (Alpha, Omega, or social norms–based) or with no intervention (see Appendix 9).

The study included three recipe options: *Spaghetti Bolognese*, *Carrot Pancakes*, and *Chicken Casserole*. These recipes were selected because they showed adequate baseline acceptability and largely stable acceptance across intervention conditions (see Appendix 7 and Appendix 8). The procedure followed a two-step process:

1. Recipe selection. Participants were first asked to indicate which of the three dishes they would be willing to prepare. If no preference was indicated, a recipe was randomly assigned.
2. Intervention assignment. Following recipe selection, participants were randomly assigned to one of 21 experimental conditions, comprising 20 intervention conditions featuring social influence and norms–based persuasion messages and one control condition without a persuasion message. Participants were then shown their selected recipe together with an ingredient-substitution recommendation corresponding to the assigned intervention or control condition.

After exposure to the intervention, participants completed the outcome measures. A detailed description of the megastudy scenario is provided in Appendix 1.

Participants were randomly assigned to one of 21 between-subjects conditions. Twenty conditions included behavioural interventions (4 social norms, 8 Alpha, and 8 Omega strategies), while one condition served as a control in which no intervention was presented. Randomization was implemented separately for each of the three recipes, such that each recipe was paired with all 21 experimental conditions. This procedure ensured approximately equal exposure to each condition within each recipe.

To ensure statistical validity, a-priori power analyses were performed to determine the minimum sample size required to detect meaningful effects across multiple experimental conditions. This planning maximized statistical efficiency—ensuring sufficient sensitivity for pairwise comparisons—while avoiding unnecessary data collection. The resulting sampling plan supports robust inference, adhering to the principles of data minimization and ethical research design. The recruitment target was calculated via G*Power and adjusted upward to offset potential dropouts, ensuring the final sample size met the study's statistical power requirements. Based on these calculations, we targeted a sample size of N = 2500, assuming a small effect size (w = 0.10), an alpha of .05, and a power of 80%.

4.3 Ethical compliance & preregistration

In line with EU open science principles and established best practices for megastudy preparation (Duckworth & Milkman, 2022), the study was preregistered on the AsPredicted platform (see https://aspredicted.org/5da6iq.pdf). Preregistration was used to ensure transparency and methodological rigor by clearly defining the research objectives, hypotheses, study design, and analysis plan prior to data collection, thereby protecting the integrity of the findings. In parallel, the study underwent a formal ethical evaluation and received ethical approval from the Institutional Ethical Review Board according to the procedures determined in the Regulation of Vilnius University Faculty of Economics and Business Administration (VU FEBA) Institutional Review Board in the Area Consumer Decision Making (see Appendix 10). Together, these procedures demonstrate adherence to EU requirements for open, transparent, and ethically sound research.

4.4 Megastudy results

A total of 2,500 responses from the United Kingdom were collected via the Prolific Academic crowdsourcing platform. The data collection procedure complied with the European Union General Data Protection Regulation (GDPR). Informed consent was obtained electronically from all participants; responses were fully anonymized, and data management followed a predefined protocol to ensure ethical handling and secure storage. After excluding incomplete questionnaires and participants who failed the attention check, the final sample consisted of 2,297 valid responses.

4.4.1 Demographic characteristics

The majority of the sample were female participants (58.3%) with higher education (approximately 63% hold a bachelor's degree) and employed (61.3% professionally employed and 10% self-employed).

The age of participants ranged from 18 to 84 years (M_{age} =46 years, SD = 13.8). Approximately half of the participants (49.9%) indicated a preference for meat-based meals. In addition, 17.5% were identified as flexitarian, 6.9% as vegetarian, and 2.2% reported a preference for vegan diets. A further 2.4% of participants indicated that they follow a pescatarian diet, while 19.6% reported not adhering to any specific dietary pattern. The remaining 1.6% of participants followed dietary types other than those provided in the survey options.

Regarding cooking behaviour, the majority of participants (63%) reported that they predominantly consume home-cooked meals. Of these, 22% indicated that they cook every day, while 41% reported cooking almost every day. In addition, 29% of participants stated that they cook several times per week.

Only a very small proportion (0.13%) reported that they never cook. The remaining 8% reported cooking less frequently, including about once a week (3.3%), a few times a month (3.3%), and less than once a month (1.4%).

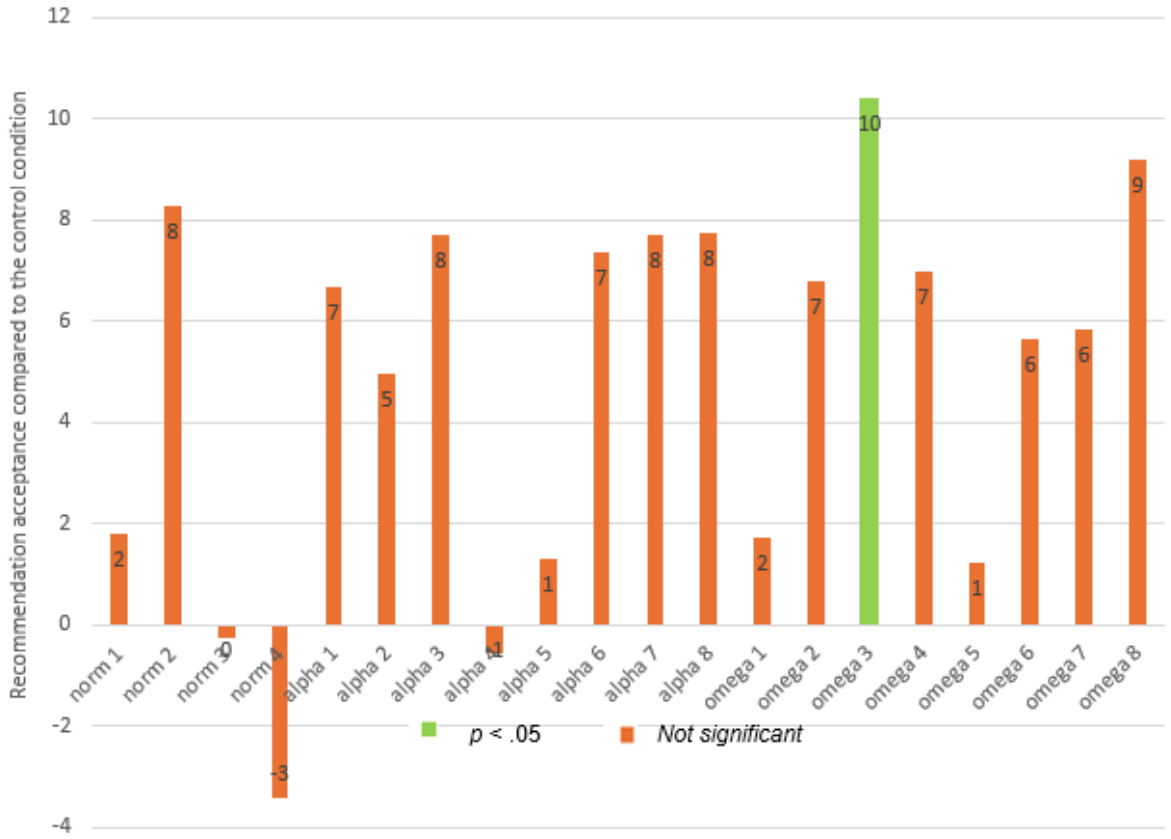
Participants were also asked about their use of recipes when cooking. The findings show that approximately 5% of participants use recipes almost every day. About 23% reported using recipes several times per week, while 18.7% indicated using recipes about once a week. In contrast, around 30% of participants stated that they use recipes only a few times per month, and 19% reported using recipes less than once a month. The remaining 4.1% indicated that they never use recipes when cooking.

Participants were also asked to indicate their level of confidence in their cooking behaviours with respect to healthy and sustainable practices. Approximately 73% reported feeling confident that they prepare healthy meals, while about 39% indicated confidence in cooking sustainably.

4.4.2 Behavioural interventions using social influence and norms effectiveness

First, the entire sample was analyzed. Logistic regression showed that intervention conditions were not significant in increasing recipe recommendation acceptance. However, the exception was the Omega intervention "healthiness guaranteed" that increased participants' acceptance of the recipe improvement recommendations (see Figure 5). The lack of other intervention effects can possibly be explained by a ceiling effect, as the majority of participants in the control condition (71 %) accepted the recipe recommendation, which is substantially higher than what we found in the pilot study 1.

Figure 5. Intervention effectiveness for the entire sample



Second, we analyzed the results only for males, who generally had lower acceptance of recipe recommendations, exploring further our ceiling effect hypothesis. Logistic regression indicated that men who feel more confident in their knowledge of sustainable cooking are more likely to accept recipe recommendations (see Figure 6 and Table 10).

Figure 6. Intervention effectiveness for males who feel more confident in their knowledge of sustainable cooking

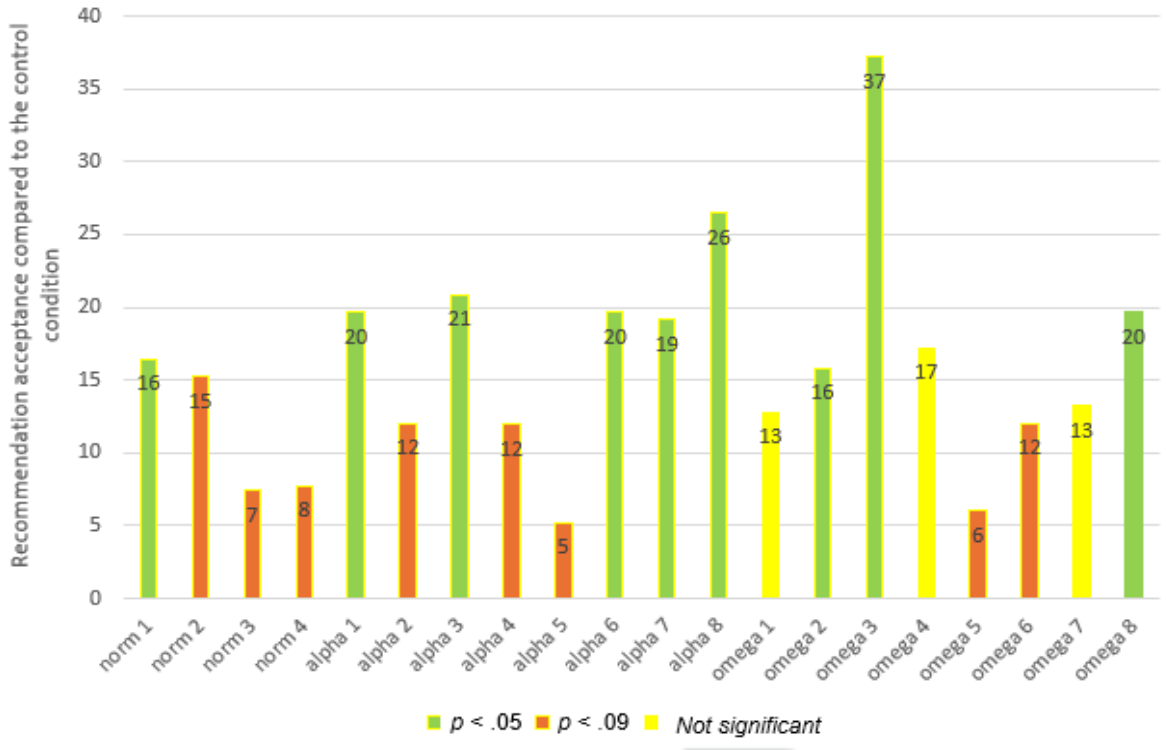
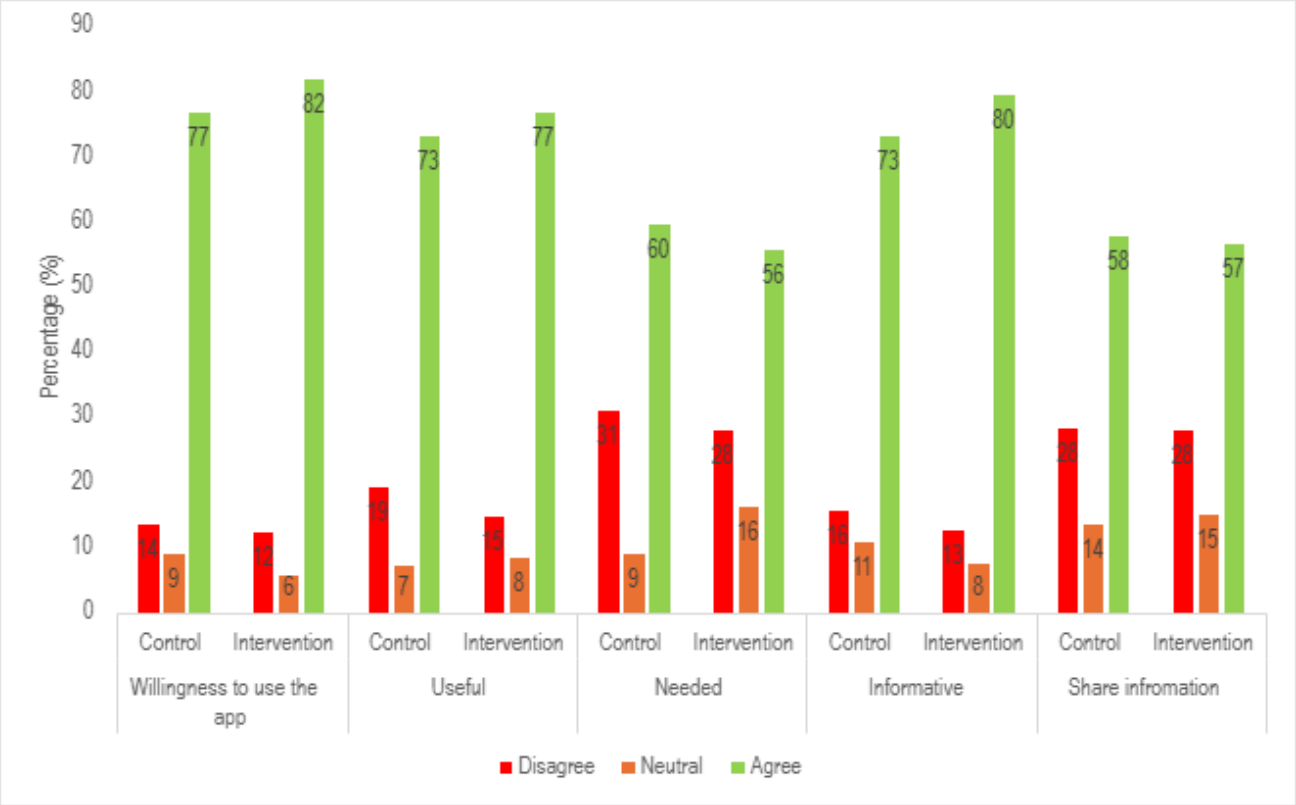


Table 10. List of effective interventions for male respondents who feel more confident in their knowledge of sustainable cooking

Intervention condition
Norm 1: Join the 75% who accept this recommendation
Alpha 1: We're doing our part for better diets. Can we count on you?
Alpha 2: Free pro tip for you: swap this one ingredient.
Alpha 3: Step up and make the switch to better food ingredients today.
Alpha 6: Recommended by RecipeWatch healthy diet experts.
Alpha 7: Kudos for cooking at home! You are going to love this suggestion!
Alpha 8: This is our users' favourite recommendation.
Omega 1: Why not go for the better option?
Omega 2: Your future self will thank you for this simple swap - why not start now?
Omega 3: Healthiness guaranteed.
Omega 4: It's a little different, but give it a shot!
Omega 7: As someone who cares about great food choices, you'll appreciate this smart swap!
Omega 8: You might feel hesitant to replace familiar ingredients. But you might like it

Third, the majority of participants indicated willingness to use the RecipeWatch app if it was free of charge and perceived the RecipeWatch app to be useful, informative, and needed. Exposure to the intervention vs control condition did not have any effects, in other words, there was no difference in the recommendation of acceptance among interventions vs. control conditions (see Figure 7).

Figure 7. Intentions and perceptions of RecipeWatch app



5. Role of seasonality, culture, regionality, nationality, and religion

This section presents the results of Task 3.2, which examined how the effectiveness of behavioural interventions varies across contextual and socio-cultural factors, including seasonality, culture, regionality, nationality, and religion. Building on insights from WP2 and the intervention development in Task 3.1, the analysis focuses on identifying conditions under which interventions are boosted, suppressed, or risk backfiring. All interventions were tested in online settings, yielding a comparative effectiveness matrix that informs the selection of context-sensitive interventions for further real-world validation in WP6.

5.1 Baseline Model and Analytical Strategy

As a baseline, we first estimated a logistic regression model predicting acceptance of healthier and more sustainable recipe recommendations using only intervention conditions and socio-demographic controls. The overall model fit was significant ($Wald\ x^2$ (25) = 44.36, $p < .01$). In this specification, none of the intervention conditions differed significantly from the reference category, while gender emerged as a robust predictor, with men significantly less likely than women to accept recommendations ($\beta = -0.52$, $p < .001$).

When contextual and socio-cultural factors - such as seasonality, cultural orientation, and regionality - were introduced as main effects and moderators in subsequent models one-by-one, overall model fit improved, and several substantively meaningful effects emerged. Taken together, these results indicate that acceptance is shaped less by interventions alone and more by the alignment between interventions and these contextual and socio-cultural factors, underscoring the added explanatory value of incorporating such factors beyond an intervention-only approach.

In contrast, religion and ethnic background were examined as background characteristics rather than moderators. While moderation by these variables was conceptually considered, estimating interaction effects would have required a large number of parameters relative to subgroup sizes, leading to sparse cells and unstable estimates; consistent with established guidance for logistic regression with limited events per parameter (Peduzzi et al., 1996), interaction terms were therefore not estimated. Taken together, the results suggest that religion and nationality-related background characteristics play a more limited and less systematic role in shaping acceptance compared to contextual and socio-cultural factors, reinforcing the central importance of such factors over demographic identity in explaining receptiveness to recipe recommendations.

Below, we present detailed results for each contextual and socio-cultural factor as well as for each demographic identity variable (see Tables 11 and 12 for the summary of the main findings).

5.2 Seasonality

To understand why some participants were more willing than others to adopt healthier and more sustainable recipe recommendations, we estimated a logistic regression model that accounted for different interventions as well as key socio-demographic characteristics, including seasonal food orientation. Seasonality was measured using a self-developed, four-item scale (Cronbach's $\alpha = .89$), in which participants indicated their agreement on a seven-point Likert scale (1 = *totally disagree*; 7 = *totally agree*) with statements reflecting the perceived taste advantages of seasonal foods and the importance of eating seasonally in their diet (e.g., "I believe seasonal vegetables taste better than out-of-season produce" and "Eating seasonal foods is an important part of my diet"). The overall model fit was significant ($Wald\ x^2$ (26) = 68.94, $p < .001$). Noteworthy, this scale was also used in WP2 to measure consumers' seasonal orientation.

Results show that seasonal food orientation plays a central role in shaping acceptance: participants who attached greater importance to eating seasonally were significantly more likely to accept proposed recipe

changes ($\beta = 0.23$, $p < .001$). Substantively, each one-unit increase in seasonal orientation was associated with an approximately 25% increase in the odds of acceptance. This pattern indicates that values related to seasonality are a stronger driver of behavioural uptake than the specific interventions alone, underscoring the importance of aligning interventions with consumers' existing food-related orientations. None of the experimental intervention conditions differed significantly from the control condition. Among the control variables, gender emerged as a significant predictor: men were less likely than women to accept recommendations.

A logistic regression including interactions between interventions and seasonal food orientation revealed significant moderation effects ($Wald\ x^2\ (46) = 108.29$, $p < .001$). While seasonal orientation no longer showed a uniform main effect on acceptance, it significantly amplified the effectiveness of specific interventions - most notably omega 1 ($\beta = 0.90$, $p = .001$), as well as alpha 5 ($\beta = 0.63$, $p = .019$) and alpha 7 ($\beta = 0.52$, $p = .045$; see Table 11 for details). These findings suggest that seasonally oriented consumers are particularly responsive to certain types of interventions, rather than uniformly accepting all of them.

5.3 Culture

Cultural aspects of nutrition also played a substantial role in shaping acceptance ($Wald\ x^2(26) = 75.12$, $p < .001$). Participants for whom food is more strongly embedded in cultural traditions, practices, and cross-cultural exchange were significantly more likely to accept recipe recommendations ($\beta = 0.25$, $p < .001$), corresponding to an approximately 28% increase in the odds of acceptance per unit increase in cultural orientation. As in previous models, intervention conditions did not differ significantly, and men were less likely than women to accept recommendations.

Interaction models further revealed that cultural orientation selectively enhanced responsiveness to particular interventions ($Wald\ x^2\ (46) = 114.74$, $p < .001$). Specifically, cultural orientation strengthened acceptance under norm 2 ($\beta = .57$, $p = .033$), omega 5 ($\beta = .58$, $p = .022$), and omega 7 ($\beta = .56$, $p = .028$; see Table 11 for details). These results indicate that cultural food values make people more responsive to some interventions, but not more accepting overall.

5.4 Regionality

Regional food orientation was examined using two complementary indicators of locavorism: a composite measure capturing perceived quality and nutritional benefits of locally produced food, and a single item capturing perceived environmental benefits (Cronbach's $\alpha = .81$, adapted from Reich et al., 2018). Both dimensions were strongly and positively associated with acceptance. The composite locavorism measure increased the odds of acceptance by approximately 32% per unit increase ($\beta = 0.28$, $p < .001$), while environmental locavorism increased the odds by approximately 22% ($\beta = 0.20$, $p < .001$). Intervention effects remained non-significant, and gender continued to predict lower acceptance among men.

Moderation analyses revealed that locavorism selectively strengthened acceptance under specific interventions. The composite measure of perceived quality and nutritional benefits amplified acceptance under norm 3 ($\beta = 0.67$, $p = .014$), alpha 4 ($\beta = 0.53$, $p = .027$), alpha 5 ($\beta = 0.53$, $p = .030$), alpha 7 ($\beta = 0.72$, $p = .032$), and omega 1 ($\beta = 0.51$, $p = .037$), while environmental locavorism strengthened acceptance particularly under norm 3 ($\beta = 0.80$, $p = .010$), alpha 2 ($\beta = 0.97$, $p = .006$), and omega 7 ($\beta = 0.66$, $p = .040$; see Table 11 for details). Together, these findings indicate that regional food values - whether grounded in perceived quality or environmental considerations - enhance responsiveness to certain interventions rather than uniformly increasing acceptance.

5.5 Price consciousness and financial constraints

We paid attention to vulnerable consumers by measuring participants' price consciousness and financial constraints.

We measured price consciousness using a two-item scale adapted from Koschate-Fischer et al. (2012), in which participants indicated their agreement on a seven-point scale (1 = *strongly disagree*; 7 = *strongly agree*) with statements capturing price-focused food purchasing (e.g., buying groceries mainly when they are on sale and prioritizing price when choosing food; Cronbach's $\alpha = .71$). Results show that higher price consciousness was positively associated with acceptance ($\beta = 0.11$, $p = .002$), corresponding to an approximately 11% increase in the odds of acceptance per unit increase. This suggests that more price-sensitive consumers may be particularly receptive to recipe recommendations, potentially because such recommendations are perceived as cost-effective or value-enhancing. Gender effects remained robust.

Moderation analyses revealed selective backfire effects. Higher price consciousness reduced acceptance under alpha 7 ($\beta = -0.49$, $p = .030$) and omega 2 ($\beta = -0.44$, $p = .030$; see Table 11 for details), suggesting that some interventions may conflict with cost-saving priorities among highly price-conscious consumers.

Financial constraints were measured using a four-item scale capturing food-related financial hardship over the past 12 months, in which participants indicated their agreement on a seven-point scale (1 = *totally disagree*; 7 = *totally agree*) with statements reflecting worries about not having enough food, inability to eat healthy and nutritious food, reliance on a limited variety of foods, and experiences of running out of food due to lack of money (Cronbach's $\alpha = .92$, self-developed). Results show that financial constraints were positively associated with acceptance ($\beta = 0.08$, $p = .014$), corresponding to an approximately 9% increase in the odds of acceptance per unit increase in perceived financial hardship. This pattern suggests that individuals facing greater economic pressure may be particularly open to practical, resource-efficient recipe recommendations.

Interaction analyses showed no moderation by financial constraints: acceptance among financially constrained participants did not depend on interventions. Thus, financial hardship appears to increase baseline receptiveness rather than selectively shaping responsiveness to specific strategies.

Additionally, we examined predictors of app engagement, measured as a composite of willingness to use the app, perceived usefulness, necessity, informativeness, and willingness to share it with others. Results indicate that financial constraints were a strong predictor of engagement ($\beta = 0.13$, $p < .001$), with each unit

increase associated with approximately a 14% increase in engagement. This suggests that economically constrained individuals may view the app as a particularly valuable support tool. Gender again emerged as a robust predictor, with men reporting lower engagement than women. Overall, app engagement appears to be driven more by perceived need and structural constraints than by interventions.

Table 11. Comparative effectiveness matrix of behavioural interventions across contextual and socio-cultural moderators

Intervention		Seasonality	Cultural Orientation	Regionality - Quality/Nutrition	Regionality - environmental	Price consciousness	Financial constraints
norms 1	Join the 75% who accept this recommendation.						
norms 2	Acceptance of this recommendation has been increasing over time.		+				
norms 3	Most RecipeWatch users accept this recommendation. Choose a better ingredient!			+	+		
norms 4	Choose a better ingredient option.						
alpha 1	We're doing our part for better diets. Can we count on you?						
alpha 2	Free pro tip for you: swap this one ingredient.				+		
alpha 3	Step up and make the switch to better food ingredients today.						
alpha 4	A tiny tweak for a better meal - why not start with this small switch?			+			
alpha 5	This suggestion is made by dr. Hazel Wallace.	+		+			
alpha 6	Recommended by RecipeWatch healthy diet experts.						
alpha 7	Kudos for cooking at home! You are going to love this suggestion!	+		+		-	
alpha 8	This is our users' favorite recommendation.						
omega 1	Why not go for the better option?	+		+			
omega 2	Your future self will thank you for this simple swap - why not start now?					-	
omega 3	Healthiness guaranteed.						
omega 4	It's a little different, but give it a shot!						
omega 5	You are worth a better version.		+				
omega 6	We're here to empower you - try this simple swap and see the impact yourself!						
omega 7	As someone who cares about great food choices, you'll appreciate this smart swap!		+		+		
omega 8	You might feel hesitant to replace familiar ingredients. But you might like it.						

Note: "+" indicates that the moderator boosts the effectiveness of the intervention (i.e., consumers for whom the moderator is more salient are more likely to accept recommendations when the intervention is present, compared to the control condition). "–" indicates

that the moderator suppresses the intervention effect (i.e., lower acceptance compared to the control condition). Empty cells indicate that no statistically significant effect was observed.

5.6 Religion

Religious affiliation was examined as a background characteristic, with Christians serving as the reference category. Participants identifying as Jewish (n = 9) were omitted from estimation due to perfect prediction, as all accepted the recommendation (see Appendix 11 for the sample distribution across religious affiliation groups). Acceptance did not differ significantly between Christians and most other religious groups. However, participants identifying as atheist ($\beta = -0.41$, $p = .002$) and those selecting "other" religion ($\beta = -1.05$, $p = .003$) were significantly less likely to accept recommendations. Overall, religious affiliation was not a strong or systematic predictor of acceptance, although certain non-religious or non-classifiable identities were associated with lower receptiveness.

5.7 Ethnic background

Ethnic background was included as a context-specific proxy for nationality-related background, allowing for a more meaningful interpretation within this setting. Ethnic background was measured using self-reported identification, with participants identifying as English serving as the reference category. Results from the logistic regression model indicate that, for most ethnic groups, acceptance did not differ significantly from that of English participants. However, two notable differences emerged. Participants identifying as Scottish were significantly less likely to accept recipe recommendations compared to the reference group ($\beta = -0.48$, $p = .009$), whereas participants identifying as Northern Irish were significantly more likely to accept recommendations ($\beta = 0.87$, $p = .044$). No statistically significant effects were observed for Welsh, Polish, South Asian, mixed/multiple ethnic backgrounds, or other categories, nor for participants who preferred not to disclose their ethnic background. Overall, these findings suggest that ethnic background is not a systematic driver of receptiveness to recipe recommendations, although specific subgroup differences may exist. As in previous models, gender remained a strong predictor, with men less likely than women to accept recommendations.

Table 12. Overview of the effects of socio-cultural and socio-demographic factors on acceptance of recipe recommendations

Predictor	Main effect on acceptance	Pattern of effects
Religion	limited or subgroup-specific	Most groups do not differ from Christians; atheists and "other" religions show lower acceptance.
Ethnic background	limited or subgroup-specific	No systematic pattern; Scottish participants lower and Northern Irish participants higher than English (reference group).
Gender (men vs. women)	Significant (-)	Men are consistently less likely than women to accept recommendations.

6. Motivation for reducing waste and delivery choices

Within the framework of WP3, and specifically Task 3.3, we identified and synthesized key insights to inform the selection of the most promising interventions to be further validated in WP6. The objective of Task 3.3 was to explore motivations for reducing food waste and for choosing sustainable delivery options.

To achieve this objective, a two-stage methodological approach was adopted. Initially, a literature review was conducted to identify behaviours associated with waste reduction and delivery choices in the nutritional domain. The literature search was structured around three core behavioural dimensions — food waste mitigation, plastic waste reduction, and the adoption of sustainable delivery options — with selection criteria prioritizing validated psychometric scales demonstrating high sensitivity in quantifying these specific behaviours. Following a rigorous screening process, the five most robust instruments were selected, and subsequently integrated into a sequential phase of quantitative experiments. In the second phase, two empirical studies were conducted to investigate consumer behaviours regarding food waste, plastic waste, and delivery preferences. The findings provide an evidence-based foundation for designing targeted behavioural interventions to be further validated in the WP6.

6.1 Study 1: Exploring Motivation for Reducing Waste and Delivery Choices

This first study was conducted in conjunction with Pilot Study 2, enabling cross-variable analysis. The study explored the intercorrelations between consumer intentions and behaviours regarding food and plastic waste, delivery preferences, and the propensity to adopt a sustainability-focused application (*RecipeWatch app*). These relationships were further analyzed in relation to demographic determinants.

6.1.1 Measures

The questionnaire was developed in English and included measures of self-reported food waste behaviour, intentions to avoid food waste, leftover reuse routines, self-reported plastic waste behaviour, intentions to avoid plastic waste, intentions to use sustainable delivery options, intentions to use the RecipeWatch app, self-reported frequency of cooking at home, sustainable and healthy cooking knowledge, diet type, and socio-demographic variables.

Exploratory factor analysis and internal consistency reliability tests were conducted using IBM SPSS Statistics to assess the construct validity and reliability of the measurement scales, thereby ensuring the methodological robustness of the questionnaire and the credibility of subsequent analyses (see Appendix 12)

Food waste behaviour. The food waste behaviour scale comprised one general item assessing overall household food waste and four items capturing waste across specific food categories that prior research has identified as particularly prone to waste - milk and dairy, fruits and vegetables, meat and fish, and bakery products (based on Stefan et al., 2012). Exploratory factor analysis showed that the items formed a clear

one-factor solution with moderate to high factor loadings, and the scale demonstrated good internal consistency (Cronbach's α = .83), indicating reliable measurement of household food waste behaviour.

Leftovers reuse routines. Routines related to the reuse of leftovers were measured using a three-item scale capturing households' typical practices regarding the storage of leftovers and the methods by which they are reused. Previous studies have shown that leftovers reuse routines are among the main behavioural drivers of food waste and contribute directly to the amount of food discarded at the household level (Stancu et al., 2016). The leftovers reuse routines scale showed acceptable internal consistency (Cronbach's α = .77), with most items loading strongly on a single factor, indicating a coherent construct of routine leftovers handling practices. In contrast, the item on transforming leftovers into a different dish exhibited a weak loading and very low communality, suggesting poor alignment with the core construct and warranting reconsideration in future scale refinement.

Intention to avoid food waste. This construct was measured using three TPB-based items (Ajzen, 1991), capturing goals and efforts to avoid food waste (Stancu et al., 2016). The scale showed good internal consistency (Cronbach's α = .82), with all items loading strongly on a single factor and exhibiting moderate to high communalities, supporting its one-dimensionality and reliability as a measure of short-term household intentions. Overall, the scale provides a reliable measure of short-term household intentions to avoid food waste.

Plastic waste reduction behaviour. Plastic waste reduction behaviour was measured using two self-report items capturing both general effort and recent behavioural change in reducing plastic waste. Both items loaded very strongly on a single factor (loadings = .88) with high communalities (.78), indicating that they coherently represent a unidimensional construct of plastic waste reduction behaviour. The scale demonstrated very good internal consistency (Cronbach's α = .88), supporting the reliability of the measure, although the two-item format limits the breadth of behavioural coverage.

Intention to avoid plastic waste. This construct was measured with three items assessing participants planned future purchasing and food-handling behaviours related to plastic reduction. The scale was adapted and shortened from an existing validated scale (Heidbreder et al., 2022). The scale demonstrated acceptable reliability for exploratory research (Cronbach's α = .66). Item loadings were moderate (.55–.72) with low to moderate communalities, suggesting that while the items capture a common underlying intention, the construct is somewhat more heterogeneous than the other intention measures.

Sustainable delivery-related behaviours. While established scales were available for waste-related behaviours, the emerging nature of research on sustainable delivery revealed a lack of validated instruments for measuring delivery preferences. Therefore, an original scale was developed for this study to address this empirical gap. Sustainable delivery-related intentions were measured using three items capturing preferences for climate-friendly delivery services, low-emission transport modes, and willingness to pick up orders to reduce environmental impact. The scale demonstrated acceptable internal consistency (Cronbach's α = .76). Factor loadings were strong for preferences regarding climate-friendly services and low-emission delivery modes, whereas the pickup preference showed a comparatively weaker loading, suggesting that it reflects a related but somewhat distinct aspect of sustainable delivery intentions.

The study also included measures of intention to use the RecipeWatch app, frequency of cooking at home, sustainable cooking knowledge, healthy cooking knowledge, diet type, gender, and age. The study scenario is provided in Appendix 6.

6.1.2 Results

Categorical variables are presented as frequencies (%), while continuous variables are reported as means ± standard deviations

Demographic characteristics

The study analyzed responses from 150 individuals recruited via the Prolific Academic online panel. The sample was 51% male, with participants ranging from 21 to 77 years of age (M_{age}= 44.2 years). Approximately half of the participants (49.3%) preferred meat-based meals. In addition, 16.7% identified as flexitarian, 6% as vegetarian, and 0.7% reported a preference for pescatarian diets. A further 2.4% of participants reported following a pescatarian diet, while 24% reported not adhering to any specific dietary pattern. The remaining 3.3% of participants followed dietary types not included in the survey options.

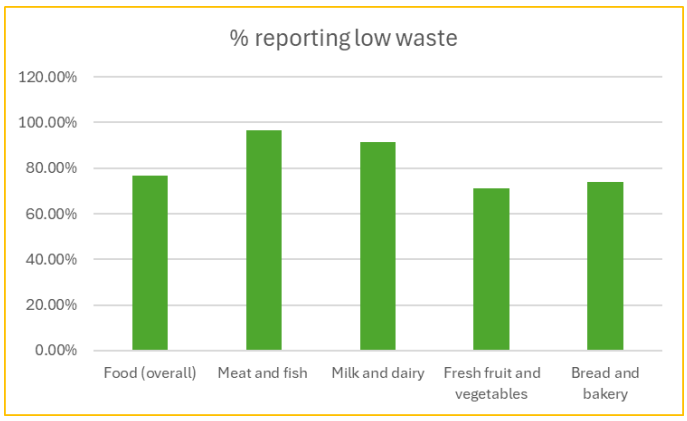
Regarding cooking behaviour, the majority of participants cook every day: 38% cook every day, and 40% cook almost every day. In addition, 18% of participants reported cooking several times per week. Only a very small proportion (0.7%) reported never cooking. The remaining 3.3% reported cooking less frequently, including about once a week (1.3%), a few times a month (0.7%), and less than once a month (1.3%).

Participants were also asked to indicate their level of confidence in their cooking behaviours regarding healthy and sustainable practices. Approximately 75.8% reported feeling confident that they prepare healthy meals, while about 39% indicated confidence in cooking sustainably (indicating 5-7 on the Likert scale).

Food-waste behaviour

Frequency distributions indicate that household food waste is generally low, with a total of 76.7% of participants reporting that they waste hardly any food (34.7%) or less than 10% of food per week (42.0%). Waste levels vary markedly by food category. Meat and fish exhibit the lowest levels of waste, with 96.7% of participants reporting hardly any (74.7%) or less than 10% (22.0%) waste, followed by milk and dairy (91.4%; 68.7% hardly any, 22.7% less than 10%). Fresh fruit and vegetables show more variable waste levels (71.3%; 33.3% hardly any, 38.0% less than 10%), while bread and bakery products exhibit the highest and most variable waste (74.0%; 32.7% hardly any, 41.3% less than 10%). Overall, households minimize waste for higher-value items (meat/fish, dairy), while more perishable foods—especially fresh produce and bakery products—are most vulnerable to wastage, indicating priority targets for waste-reduction interventions. See Figure 8.

Figure 8. Frequency of Weekly Household Food Waste



Leftovers reuse routines

Leftover reuse habits show generally high agreement with positive leftover-management practices. On a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree), participants reported frequent storage and reuse of leftovers (storing appropriately: $M = 5.72$, $SD = 1.56$; overall leftover management: $M = 5.91$, $SD = 1.53$), while transforming leftovers into new dishes is less common ($M = 3.37$, $SD = 1.73$). Overall, households appear effective at retaining and safely reusing leftovers but are less inclined to creatively repurpose them, indicating a clear behavioural gap and a potential intervention point for food-waste reduction initiatives (e.g., promoting leftover-based meal planning and recipe use).

Intention to avoid food waste

On a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree), participants reported very strong short-term intentions to avoid food waste, with high agreement across all three items (intend not to throw food away: $M = 6.17$, $SD = 1.27$; goal not to throw food away: $M = 6.31$, $SD = 1.03$; will try not to throw food away: $M = 6.37$, $SD = 0.92$). The consistently high means and relatively low dispersion indicate strong motivational readiness for waste-reduction behaviours.

Plastic waste reduction behaviour

Self-reported plastic waste–related behaviours indicate a generally positive orientation towards waste reduction. On a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree), participants reported relatively strong agreement with the statement "I make an effort to reduce my plastic waste in my daily living" ($M = 4.96$, $SD = 1.65$). In contrast, agreement with the retrospective statement "Thinking back over the past few weeks, I have reduced a great deal of plastic waste" was more moderate ($M = 3.94$, $SD = 1.77$), suggesting that while general motivation to reduce plastic waste is high, perceived recent reductions in plastic waste are more limited.

Intention to avoid plastic waste

On a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree), participants reported moderate intentions to reduce plastic use in future purchasing contexts: intentions to purchase fresh products in

glass packaging instead of plastic were relatively low to moderate (M = 3.01, SD = 1.70), as were intentions to bring and use multiple personal food containers when shopping (M = 3.16, SD = 2.03). Intentions to avoid purchasing fruits and vegetables wrapped in plastic were comparatively higher, though still moderate overall (M = 3.97, SD = 1.79). These results indicate that, while there is some willingness to engage in plastic-reducing practices, intentions remain limited, particularly for behaviours that require changes to established shopping routines.

Sustainable delivery-related behaviours

Intentions toward climate-friendly food delivery are low to moderate. On a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree), participants reported weak endorsement for seeking climate-friendly delivery services (M = 2.79, SD = 1.75) and modest preference for low-emission couriers (M = 3.37, SD = 1.92), while willingness to pick up orders locally to reduce environmental impact is comparatively higher (M = 4.11, SD = 1.97). Overall, participants are more inclined toward behaviours that avoid delivery than toward actively selecting greener delivery options, suggesting convenience and availability remain key barriers to sustainable delivery choices.

Bivariate Correlations Between Key Study Variables

Bivariate correlations were computed to examine the relationships between food and plastic waste behaviours, leftovers reuse routines, intentions to reduce food and plastic waste, sustainable delivery-related intentions, and intentions to use the RecipeWatch app. In addition, associations with relevant contextual and sociodemographic variables were explored, including frequency of cooking at home, perceived sustainable and healthy cooking knowledge, diet type, gender, and age. This correlational overview provides an initial descriptive assessment of how key sustainability-related behaviours and intentions are interrelated within the sample. SPSS software, version 29 (IBM *SPSS STATISTICS*) was used for all statistical analyses. Two-sided level of significance was set at $p < .05$.

For all multi-item constructs, scale scores were computed as the mean of the respective items, including sustainable delivery-related behaviours, intention not to waste plastic, plastic waste reduction behaviour, intention not to waste food, leftovers reuse routines, and food waste behaviour. To ensure a consistent interpretation across constructs, all scales were harmonized to run from low to high, with higher values indicating more sustainable orientations or behaviours. Accordingly, the food waste behaviour scale was reverse-coded prior to rescaling, such that higher values indicate more sustainable behaviour (i.e., lower food waste), in line with the coding of the other food-, plastic-, and delivery-related behaviour scales. See Appendix 13 for the correlation table. Correlation coefficients marked with one asterisk (*) indicate statistical significance at the 5% level ($p < 0.05$). Coefficients marked with two asterisks (**) indicate statistical significance at the 1% level ($p < 0.01$).

Intention–Behavior Consistency in Food and Plastic Waste Domains

Overall, the pattern of associations suggests a limited behaviour–intention gap within domains, with self-reported intentions closely aligned with corresponding waste-related practices.

- In the food domain, lower reported food waste co-occurs with stronger food waste reduction intentions (r = .31**), more frequent leftover reuse routines (r = .33**), and higher sustainable cooking knowledge (r = .17*). This convergence indicates that participants who report intending to avoid food waste also tend to report enacting waste-reducing practices, consistent with a relatively small intention–behavior gap for food waste–related behaviours.
- Leftover reuse routines are strongly aligned with food waste intentions (r = .46**) and cooking-related competences, particularly healthy cooking knowledge (r = .50*). This pattern further supports the interpretation that intentions to reduce food waste are embedded in routinised practices and practical skills.
- Within the plastic domain, intention–behavior consistency is even more pronounced. Plastic waste reduction intentions are strongly aligned with plastic waste behaviour (r = .53**) and delivery-related behaviours (r = .55**), indicating a high degree of correspondence between stated intentions and enacted choices in packaging- and delivery-related contexts. Plastic waste behaviour also shows strong convergence with delivery-related behaviours (r = .52**) and moderate associations with sustainable cooking knowledge (r = .46**), suggesting that these practices cluster as a coherent set of enacted pro-environmental behaviours within this domain.
- In contrast, cross-domain intention–behavior alignment is limited. Food waste intentions show negligible associations with plastic-related behaviours and intentions ($r \approx$ .10–.14), and plastic waste reduction intentions are essentially unrelated to food waste behaviour (r = –.01) and only weakly associated with food waste intentions (r = .09). This pattern indicates that intention–behavior consistency is largely domain-specific, rather than reflecting a generalized pro-environmental orientation across food and plastic waste contexts.

Taken together, these findings point to relatively small intention–behavior gaps within specific waste domains, alongside limited spillover across domains.

Intentions to use the RecipeWatch app

Intentions to use the RecipeWatch app correlate positively with plastic waste behaviour (r = .31**), plastic waste intentions (r = .33**), and delivery-related behaviours (r = .30**), but not with food waste constructs. This indicates that the app is most appealing and perceived as most useful among individuals who are already highly engaged in plastic-reduction and sustainable delivery behaviours.

Cooking frequency and knowledge

- Frequency of cooking at home is negatively related to leftover reuse routines (r = –.17*) and plastic waste behaviour (r = –.20*), and strongly negatively related to healthy cooking knowledge (r = –.45**), implying that more frequent cooking does not necessarily equate to stronger waste-minimizing practices or cooking knowledge in this sample.
- Sustainable cooking knowledge is positively related to multiple pro-environmental behaviours (food waste behaviour, leftover reuse, plastic behaviour, delivery behaviours), supporting its role as a cross-cutting enabler.

Demographics and diet

- Age is positively associated with food waste behaviour (r = .26**), indicating that increasing age is linked to more sustainable food waste practices, as reflected in lower self-reported levels of food waste.
- Diet type shows minimal associations with waste outcomes, indicating limited differentiation by dietary patterns.
- Gender shows no meaningful correlations with the main behavioural constructs.

Conclusion
Overall, the correlations reveal coherent clusters: (i) food waste reduction aligns with leftover routines and cooking knowledge; (ii) plastic reduction and delivery behaviours align closely with each other and with sustainability knowledge; and (iii) intentions to use the RecipeWatch app are more strongly connected to plastic/delivery practices than to food waste. These patterns support a domain-specific pathway to behaviour change and suggest tailoring app features differently for food waste versus packaging/delivery impacts.

6.2 Study 2: Exploring Motivation for Reducing Waste and Delivery Choices

The second study examines how food delivery preferences intersect with consumer motivations, sustainability orientations, and intentions to use the RecipeWatch App. Data were collected in conjunction with Megastudy. For Ethical procedures, see Appendix 10, for the study scenario, see Appendix 1).

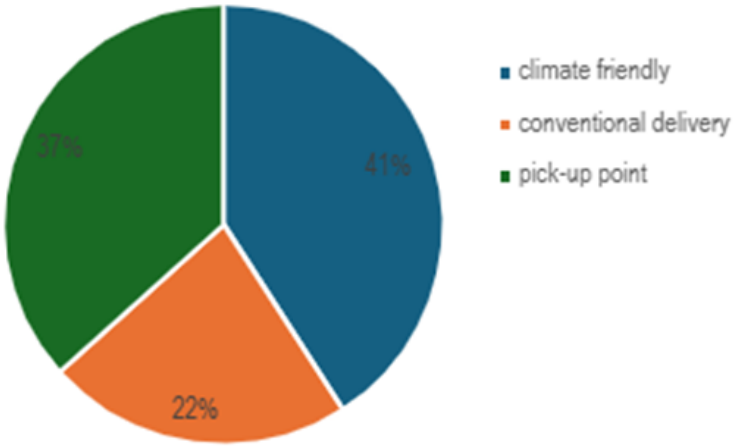
6.2.1 Measures

The questionnaire was developed in English and included measures of meal delivery options, motivations to collect orders from a nearby pickup point, intentions to use the RecipeWatch app, diet type, price-conscious, household food insecurity, and socio-demographic variables. The full questionnaire, including the detailed measurement scales, is presented in Appendix 1.

Food Delivery Preference. To measure food delivery preferences, we utilized a three-option framework within a hypothetical ordering context. Participants were presented with a hypothetical food-ordering scenario and asked to indicate their preferred delivery mode. Delivery preferences reflected varying levels of environmental impact and logistical effort, namely:

(i) climate-friendly delivery (bicycles, electric cargo bikes, electric vehicles, or walking couriers),
(ii) conventional delivery using standard internal combustion engine cars, and
(iii) self-collection from a pick-up point. See Figure 9. Distribution of Food Delivery Preferences.

Figure 9. Distribution of Food Delivery Preferences



Motivations to collect orders from a nearby pick-up point. Motivations for self-pick up were measured using a three-item 7-point Likert-type scale. Participants were asked to indicate the extent to which they agreed with statements describing potential reasons for choosing to collect their order from a nearby pick-up point, using a seven-point response format ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. The items captured (i) convenience ("I would choose a pick-up point because it is more convenient for me"), (ii) cost considerations ("I would choose a pick-up point to avoid paying delivery charges"), and (iii) environmental motivation ("I would choose a pick-up point because it is better for the environment").

Intentions to use the RecipeWatch app behavioural intentions were assessed using a single-item measure capturing intended use of the RecipeWatch service. Participants were asked to indicate the extent to which they would like to use RecipeWatch if it were provided free of charge, using a nine-point response scale ranging from 1 = *not at all* to 9 = *quite a bit*. Descriptive statistics indicate that participants reported a high intention to use the RecipeWatch app if it were free of charge ($M = 6.94$, $SD = 2.07$).

Ambivalence toward cooking habits to become more sustainable was measured using three items (conflicted, mixed, indecisive) rated on a 0–5 scale (0 = not at all; 5 = extremely) and aggregated as a mean score. Levels of ambivalence toward changing cooking habits to become more sustainable were relatively low to moderate ($M = 2.31$, $SD = 1.26$), suggesting limited psychological resistance to adopting more sustainable cooking practices.

Self-reported confidence in sustainable cooking knowledge was assessed using a single item asking participants to evaluate how confident they feel in their knowledge regarding sustainable cooking, rated on a seven-point scale (1 = not confident at all; 7 = very confident). Overall, self-reported confidence in sustainable cooking knowledge was moderate ($M = 4.03$, $SD = 1.41$).

Price consciousness was measured using two items adapted from Koschate-Fischer et al. (2012). Participants indicated their agreement on a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) with the statements: (i) *"I buy groceries mainly when they are on sale"* and (ii) *"Price is the most*

important factor for me when choosing food." Item scores were aggregated to form a composite indicator of price consciousness, with higher values indicating stronger price sensitivity. Price consciousness was moderate ($M = 3.79$, $SD = 1.46$), indicating that price considerations play a relevant but not dominant role in food purchasing decisions for many participants.

Household food insecurity was assessed using four items capturing financial constraints on food access over the past 12 months. Participants indicated their agreement on a seven-point scale (1 = totally disagree; 7 = totally agree) with statements reflecting whether, due to lack of money, they (i) worried about not having enough food to eat, (ii) were unable to eat healthy and nutritious food, (iii) ate only a few types of foods, and (iv) experienced their household running out of food. Item scores were aggregated to form a composite indicator of household food insecurity, with higher values indicating greater level*s of food-related financial vulnerability. Household food insecurity was generally low (M = 2.24, SD* = 1.58), suggesting that most households did not frequently experience food-related financial constraints

6.2.2 Results

Analysis of Motivations for Using Self -Pick-up Points by Preferred Food Delivery Method

A one-way multivariate analysis of variance (MANOVA) was conducted to examine whether motivations for using a self- pick-up point (convenience, cost-avoidance, and environmental motivation) differed across three delivery option preferences: climate-friendly delivery, conventional delivery, and self-pick up. The multivariate effect of delivery option was significant, *Wilks'* $\Lambda = .844$, $F(6, 4580) = 67.47$, $p < .001$, partial $n^2 = .08$, indicating that the combined motivational profile differed across groups. This indicates that the combined profile of motivations differed significantly across the groups.

Follow-up univariate ANOVAs indicated that delivery preference had a significant effect on all three motivations individually. The analysis revealed significant group differences for convenience motivation, $F(2, 2292) = 66.98$, $p < .001$, $n^2 = .06$, cost-avoidance motivation, $F(2, 2292) = 58.99$, $p < .001$, $n^2 = .05$, and the most pronounced differences were observed regarding environmental motivation, $F(2, 2292) = 130.59$, $p < .001$, $n^2 = .10$.

The mean scores reveal distinct profiles for each consumer group:

- Self-Pick up Group: This group reported the highest motivations for Cost-Avoidance ($M = 6.11$, $SD = 1.34$) and Convenience ($M = 5.68$, $SD = 1.41$). This suggests that users who already prefer self-pick up view the pick-up point primarily as a functional tool for efficiency and saving money.
- Climate-Friendly Group: This group demonstrated the highest Environmental Motivation ($M = 4.70$, $SD = 1.66$). Interestingly, their environmental score was significantly higher than the conventional group ($M = 3.28$, $SD = 1.64$), but they also valued cost-avoidance ($M = 5.55$, $SD = 1.56$) quite highly.
- Conventional Delivery Group: This group consistently reported the lowest motivation scores across all categories. This pattern was most pronounced for environmental motivation ($M = 3.28$, $SD = 1.64$), which was substantially lower than in both the climate-friendly delivery group ($M = 4.70$,

SD = 1.66) and the self-pick up group (*M* = 4.55, *SD* = 1.73). This indicates that environmental considerations are markedly less salient for consumers who prefer standard car-based delivery.

Cost-Avoidance Motivation. Motivation to avoid costs was strongest among the self-pick-up group (*M* = 6.11, *SD* = 1.34). It was moderately high for climate-friendly proponents (*M* = 5.55, *SD* = 1.56). It was lowest for conventional delivery users (*M* = 5.23, *SD* = 1.78).

Environmental Motivation. Participants who preferred climate-friendly delivery (*M* = 4.70, *SD* = 1.66) and self-pick up (*M* = 4.55, *SD* = 1.73) showed significantly higher environmental motivation than participants in other groups. In contrast, those preferring conventional delivery scored substantially lower on environmental motivation (*M* = 3.28, *SD* = 1.64).

Significant Differences in RecipeWatch App Use Intentions Across Delivery Preference Groups

A one-way between-groups ANOVA was conducted with preferred delivery method (climate-friendly delivery, conventional delivery, and self-pick up) as the independent variable and intention to use the RecipeWatch app as the dependent variable. The analysis revealed a significant effect of delivery preference on intention to use the RecipeWatch app, $F(2, 2292) = 16.76$, $p < .001$. Participants preferring climate-friendly delivery (*N* = 939) expressed the strongest intention to use the app (*M* = 7.23, *SD* = 1.88). Participants preferring self-pick up (*N* = 841) followed with *M*= 6.77, *SD* = 2.13. Participants preferring conventional car delivery (*N* = 515) reported the lowest intention (*M* = 6.68, *SD* = 2.23). While the difference between conventional and self-pick up is small, the climate-friendly group stands out significantly, suggesting that users interested in sustainable logistics are also the most likely early adopters for this app.

Significant Differences in Ambivalence Toward Changing Cooking Habits Across Delivery Preference Group

A one-way between-groups ANOVA was conducted with preferred delivery method (climate-friendly delivery, conventional delivery, and self-pick up) as the independent variable and ambivalence toward changing cooking habits as the dependent variable. The analysis revealed a significant effect of delivery preference on ambivalence toward changing cooking habits, $F(2, 2292) = 21.07$, $p < .001$. Participants preferring conventional car-based delivery reported higher ambivalence (*M* = 2.62, *SD* = 1.36) than those preferring climate-friendly delivery (*M* = 2.24, *SD* = 1.23). or self-pick-up (*M* = 2.19, *SD* = 1.20).

Significant Differences in Self-Reported Sustainable Cooking Knowledge Across Delivery Preference Groups

A one-way between-groups ANOVA was conducted with preferred delivery method (climate-friendly delivery, conventional delivery, and self-pick up) as the independent variable and self-reported confidence in knowledge about sustainable cooking as the dependent variable. Confidence in sustainable cooking knowledge was significantly higher among participants preferring climate-friendly delivery (*M* = 4.23, *SD* = 1.37) than among those preferring conventional car delivery (*M* = 3.62, *SD* = 1.42), $F(2, 1784) = 25.88$, $p < .001$.

Significant Differences in Household Food Insecurity Across Delivery Preference Groups

A one-way between-groups ANOVA was conducted with preferred delivery method as the independent variable and household food insecurity as the dependent variable. The analysis revealed that household food insecurity differed significantly by delivery preference, F (2, 2292) = 16.13, p < .001. Specifically, participants preferring conventional car delivery reported the highest levels of insecurity (M = 2.50, SD = 1.73), followed by those preferring climate-friendly delivery (M = 2.30, SD = 1.59), while those preferring self-pickup reported the lowest levels (M = 2.02, SD = 1.44).

Price Consciousness Across Delivery Preference Groups

A one-way between-groups ANOVA was conducted with preferred delivery method as the independent variable and price consciousness as the dependent variable. The test revealed that price consciousness did not differ significantly across delivery preference groups (F(2, 2292) = 0.95, p = .386), with comparable mean levels observed for climate-friendly delivery (M = 3.75, SD = 1.45), conventional delivery (M = 3.86, SD = 1.45), and self-pick-up (M = 3.80, SD = 1.48).

Distribution of Preferred Delivery Methods Across Genders

Delivery method preferences are very similar across gender groups. Among men, 40.2% prefer climate-friendly delivery, 38.6% prefer self-pick-up, and 21.3% prefer conventional car-based delivery. A comparable pattern is observed among women with 41.4% preferring climate-friendly delivery, 35.3% self-pick-up, and 23.3% conventional delivery. These results indicate that climate-friendly delivery is the most frequently preferred option for both men and women, followed closely by self-pick-up, while conventional car-based delivery is the least preferred.

7. T3.4 Evaluation of behavioral interventions accessibility for vulnerable people

To ensure that behavioral interventions, especially digital tools promoting healthier eating habits, truly reach and support those who need them the most, it is crucial to evaluate their accessibility from multiple angles. This requires a systematic and structured analysis of how people interact with it, what enables or hinders their use, and whether the tool is fit to apply in their daily life.

DietWise applies the principle of proportionate universalism, defined as "actions should be universal, but with an intensity and a scale that is proportional to the level of disadvantage" (Francis-Oliviero et al., 2020). In other words, promoting healthy and sustainable diets requires solutions that work for everyone, while also addressing specific barriers faced by those in more vulnerable situations. To translate this principle into practice, a framework is needed that identifies how different groups experience an intervention and what adjustments are required to reduce inequalities in access, use and impact. The 8B's for Accessibility Framework, developed by Vlaams Instituut Gezond Leven (2019) and inspired by Bouverne-De Bie (2005), provides such a tool. It allows for a nuanced, multidimensional assessment of accessibility (see Figure 10), looking beyond superficial usability and addressing real-life conditions and burdens people may

experience. Analyzing interventions against this tool is essential to identify where universal strategies are sufficient, and where more proportionate, tailored efforts are needed to ensure equitable health outcomes.

The initial Key Performance Indicator (KPI-30) for this deliverable was to conduct an evaluation of the applicability of innovative behavioral interventions (nudges) for vulnerable citizens (situated within WP3) in the context of the 8B's for Accessibility Framework. Examples of vulnerable populations include people with lower socioeconomic status, limited health literacy, restricted digital access, and people with a migration background (Ronteltap et al., 2022; Karimi et al., 2024). Within the DietWise-project, such groups were also identified as particularly vulnerable through expert interviews in WP2 (Task 2.4).

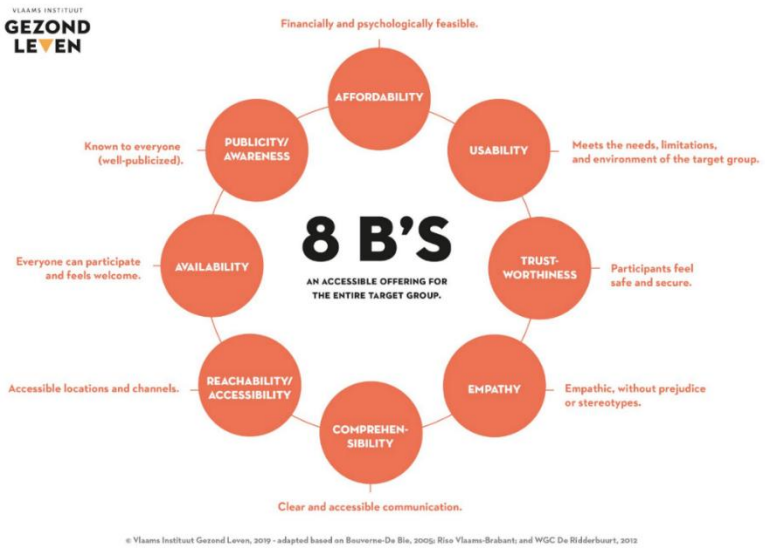
However, during the project's progression, it became apparent that a direct evaluation of these behavioral interventions using the 8B's dimensions was limited as the behavioral interventions were too short to draw broader analyses on them. As a result, this report serves as a replacement, focusing instead on analyzing whether the co-creation workshops with vulnerable citizens were accessible through the lens of the 8B's framework. These workshops were situated in WP4, T4.1.

To fulfill the KPI of conducting at least three analyses, separate but comparable analyses have been performed for the vulnerable citizen workshops conducted in the three pilot countries: Belgium, Greece, and Lithuania. Each country's analysis provides in-depth insights into the accessibility challenges and opportunities for behavioral interventions among distinct vulnerable populations. Together, these three country-specific analyses comprehensively address the KPI while providing a robust foundation for tailoring and improving the RecipeWatch-app in diverse contexts.

7.1 The 8B's of accessibility

The 8B's form a comprehensive framework to analyze and improve the accessibility of interventions, events, and projects (See Figure 10). These 8B's were originally introduced by Bouverne-De Bie (2005) in the context of creating an accessibility policy. Using the 8B's can help tailor projects or interventions like RecipeWatch to the needs and circumstances of vulnerable groups, increasing the likelihood of successful adoption and sustained use.

Figure 10. The 8B's for Accessibility Framework



The framework systematically highlights various aspects of accessibility, including Affordability, Usability, Trustworthiness, Empathy, Comprehensibility, Reachability, Availability, and Awareness/Publicity. For detailed descriptions see Appendix 14.

7.2 Methodology

7.2.1 Design

This report covers a qualitative secondary analysis of data from a co-creation workshop with vulnerable citizens in Belgium, Lithuania and Greece (Deliverable D4.1 "Co-creation workshops"), conducted within the DietWise project. The co-creation workshops had the purpose of exploring additional functions of the RecipeWatch-app that users would prefer to see. The analysis uses the 8B's for Accessibility Framework as a theoretical and analytical lens to evaluate how accessible a proposed digital intervention (the RecipeWatch app) would be for vulnerable groups and to identify directions for improvement (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019).

The approach is both deductive and inductive:

- Deductive: the eight B's are used as pre-defined thematic categories.
- Inductive: within each B, emergent subthemes and nuances are identified from the workshop data.

7.2.2 Data

The main data source are the internal reports from the three countries (Belgium, Lithuania and Greece), where vulnerable citizens participated in a co-creation session to help shape the RecipeWatch app. A

detailed description of participants is presented in Appendix 15. The total number of participants came to 21, with 6 for Belgium, 6 for Greece and 9 for Lithuania.

7.2.3 Analytical framework

The 8B's framework provides the core categories for analysis: (1) Affordability; (2) Usability; (3) Trustworthiness; (4) Empathy; (5) Comprehensibility; (6) Accessibility/Reachability; (7) Availability; (8) Awareness/Publicity. The analytic procedure is presented in Table 1.

For each B, the analysis addresses three questions:

1. Which data segments from T4.1 relate to this dimension?
2. How do these segments indicate strengths and gaps in accessibility?
3. What implications or recommendations follow for future design and implementation of RecipeWatch and similar interventions?

Table 13. The Analytic Procedure

Preparation	Based on the 8B-descriptions a coding framework was developed with 8 main codes (the 8B's) and guiding questions. The guiding questions can be found in Appendix 16.
Deductive coding	Relevant passages from the T4.1 report were manually mapped onto one or several of the 8B categories. Passages touching multiple aspects (e.g., expensive healthy products that are also rarely available) were assigned multiple codes (e.g., Affordability and Availability).
Inductive refinement	Within each B, emergent subthemes (e.g., within Affordability: cost of gluten-free products, perception that healthy food is expensive, comfort vs. health) were identified and summarized.
Synthesis per dimension	For each B, a concise narrative synthesis was written, indicating: (1) Main needs and barriers; (2) Existing facilitators and strengths; (3) Remaining gaps and risks for accessibility
Deriving recommendations	From the synthesis, concrete, practice-oriented recommendations were formulated to (hypothetically) improve future versions of the RecipeWatch app and related interventions.

7.2.4 Ethical considerations

The analysis is based on the internal workshop reports provided by the three pilot countries (Belgium, Lithuania, Greece), which summarize experiences at group level; no directly identifiable personal data was used. Findings are reported at an aggregate level and aim to respect participants' perspectives and context. The entire analysis is aligned with the 8B principle of Empathy, striving for a non-judgmental understanding of constraints faced by people in vulnerable situations.

7.3 Results

This section presents the synthesized results of the 8B-analysis conducted across the workshops in Belgium, Greece, and Lithuania. The analysis evaluated how effectively the workshop reports captured the dimensions of accessibility (the 8B's) and what this reveals about the potential applicability of the RecipeWatch intervention. Detailed country-specific findings, including strengths, gaps, and risks per dimension, are provided in Appendices 21 to 23.

The systematic screening of the workshop data through the 8B-lens highlighted the following key insights per country:

- Belgium (Appendix 17): The analysis showed strong coverage of Empathy and Usability, highlighting the centrality of "comfort food" and the impact of chronic stress on cognitive bandwidth. However, gaps were identified in Trustworthiness (specifically data privacy) and Publicity, suggesting that while the tool aligns with emotional realities, the structural pathways for trust and awareness need further development.
- Greece (Appendix 18): The results emphasized Affordability and Usability as the primary filters. Participants consistently prioritized time-saving and cost-efficiency over abstract health goals. The analysis revealed that for this group, Availability of ingredients and Comprehensibility (concise, non-moralizing reasoning) are the "make-or-break" factors for intervention adoption.
- Lithuania (Appendix 19i): For this health-motivated senior group, Trustworthiness and Comprehensibility emerged as strengths, with a clear preference for expert-based, scientifically grounded guidance. A key risk identified under Empathy was the participants' systemic distrust of the food industry, suggesting that the intervention must acknowledge these structural concerns to remain credible.

The limitations regarding the hyperspecific nature of these target groups and the challenges of generalizability are detailed in Appendix 24.

7.3.1 Overarching findings and recommendations

By synthesizing the insights from all three countries, several universal patterns emerged across the 8B-dimensions. These overarching results form the basis for the following recommendations for the future development and implementation of RecipeWatch and similar behavioral interventions. While each country presented unique cultural nuances, the following general strategic directions (summarized in Table 2) address the most critical barriers to accessibility identified across the board.

Table 14. Key recommendations for future development of RecipeWatch, structured along the 8B's

The 8B's dimensions	Recommendations for Future development of RecipeWatch
Affordability	Design cost-sensitive recommendation logic: Prioritize substitutions that are affordable, commonly available and reusable across multiple dishes. Avoid "one-off" ingredients that are expensive, hard to store or only used in one recipe. Tie sustainability to economic benefits: Frame sustainability primarily through waste reduction and cost savings (e.g. use leftovers, batch cooking, "buy once, cook three times"). Provide budget-friendly modes or filters: Allow users to indicate when budget is a priority, tailoring suggestions accordingly.
Usability	Implement minimal-input, high-value flows: Reduce the number of steps before the user receives a useful suggestion. Avoid long forms, complex configuration and repeated data entry. Embed short, concrete tips inside recipes: E.g., "Reduce salt by 30%" or "Bake instead of fry" rather than lengthy instructions. Treat taste and recipe success as core constraints: Develop constraints in the algorithm to preserve sensory outcomes where possible; clearly signal when a change may alter taste/texture. Provide step-by-step onboarding: Particularly for older adults, use guided flows (with the option to skip) for installation and first use.
Trustworthiness	Offer transparent "why" explanations: Attach brief, clear reasons to each suggestion (e.g., "less salt helps lower blood pressure", "baking uses less fat than frying"). Use a credible, non-patronizing tone: In contexts like Lithuania, explicitly link advice to national guidelines or recognized sources; in others, keep tone supportive and practical. Be honest about limitations: Clarify what the app can and cannot do; avoid overpromising on health outcomes or environmental impact. Consider a layered information design: Default: short explanation. Optional: "learn more" with more detailed evidence for users who want it.
Empathy	Use empathic, normalizing language: Emphasize that choosing comfort food is understandable, and that the goal is to make comfort food a bit healthier. Highlight and reward small successes rather than focusing on failures. Allow users to upload and improve their own recipes, valuing their expertise and food culture. Explicitly acknowledge structural and everyday constraints: Recognize time pressure, financial stress, family responsibilities and perceived food system problems in the wording of messages. Use non-judgmental language: Avoid framing that implies failure or blame; focus on small, achievable steps and on supporting users "where they are". Reflect family and cultural realities: Offer family-friendly options and respect existing comfort foods and culinary traditions; aim for "healthier within your own cuisine" rather than replacement by unfamiliar dishes.
Comprehensibility	Keep explanations short, concrete and user-centered: Use everyday examples and simple causal links ("less sugar → better for your blood sugar", "more fiber → longer feeling of fullness").

	Adapt style to audience profiles: For more literate groups (e.g., Lithuanian seniors), an expert-based tone is acceptable; for others, simpler language with relatable stories may be more effective. Support text with visual cues where possible: Icons or simple labels for time saved, money saved, and health improvements can help quick decision-making.
Accessibility/ Reachability	Build on existing community and institutional channels: Schools and parent networks (Greece), municipal health programs (Lithuania), community organizations (Belgium) can serve as entry points. Ensure technical accessibility: Optimize older or lower-end devices, low bandwidth, and avoid heavy updates; minimize lags and crashes. Plan for diverse digital skills: Provide simple entry routes (QR codes, links via trusted intermediaries) and consider alternative formats (e.g., web rather than only app, kiosk-style use in community settings).
Availability	Clarify access and support pathways: Define how users get the app, how updates are delivered, and where they can turn when something goes wrong (e.g., local support points, helplines, in app help). Integrate with existing services where possible: Consider embedding RecipeWatch in broader programs (school health initiatives, municipal health services, community centers) to increase availability and support.
Awareness/Publicity	Use trusted messengers: Teachers and school staff (Greece), municipal health professionals and program facilitators (Lithuania), community workers and peer leaders (Belgium). Tailor messages and channels to each group: For digitally active users, social media and messaging apps can be effective; for older or less connected users, offline channels (flyers, group meetings, word of mouth) may be more important. Highlight concrete benefits upfront: Communicate clearly what the app will do for them (save time, save money, keep familiar dishes but healthier) rather than leading with abstract project goals.

Conclusion on intervention accessibility

In conclusion, the 8B-analysis across the three countries indicates that the current conceptual plans for RecipeWatch provide a solid foundation for accessibility, particularly regarding Usability and Comprehensibility. The app's core features, such as personalization, simple health tips, and ingredient-based suggestions, align well with the expressed needs of vulnerable groups.

However, to be truly inclusive, the intervention must evolve from a purely technical tool into a context-aware companion. The analysis reveals that "accessibility" for these groups is not just about digital skills, but about navigating structural and emotional barriers such as chronic stress, financial insecurity, and cultural food traditions. While the current plans are promising, their ultimate success will depend on how effectively the app can integrate Empathy (acknowledging comfort food and time poverty) and Affordability (prioritizing low-cost, widely available ingredients) into its core algorithm and messaging. Without these adjustments, there is a risk that the intervention remains a "universal" tool that inadvertently excludes those facing the highest levels of disadvantage.

Appendices

Appendix 1. Megastudy Scenario

Hello and welcome,
In this study, you will be asked to read a recipe and answer questions. We seek to investigate how people process information and make decisions. You will need around 10 minutes to complete this study.
[page break]
Do you expect to be preparing any of the following recipes in the coming weeks?" [one answer possible]

- Yes, Spaghetti Bolognese
- Yes, Carrot pancakes
- Yes, Chicken casserole
- I don't know

If they give none, we select a recipe randomly.
[page break]

Let us introduce RecipeWatch – a new online tool that helps consumers make healthier and more sustainable food choices. Following RecipeWatch advice means preparing meals that benefit your health, the planet, your wallet, and your community. It involves using fresh, seasonal, and locally available foods, adding more vegetables, saving energy while cooking, and reducing food waste. RecipeWatch scans any online recipe a user is viewing and provides suggestions for healthier and more sustainable alternatives. If a recipe includes ingredients that are less healthy or less sustainable, users will see simple recommendations for improvements. They can choose to accept or dismiss these suggestions.

[page break]

Now, imagine that you are cooking using this new tool, RecipeWatch. Please read the following recipe and answer some questions.
[Manipulations insert] [Coded according to what they answered]
MAIN DV:
Accept/Dismiss

AFTER ALL THE RECIPES ARE SHOWN: secondary DV's
Behavioral intentions
How much would you like to use RecipeWatch if it was free of charge? 1 = not at all, 9=quite a bit

Perceived usefulness
To what extent do you find the RecipeWatch recommendations for you personally...
Useful 1 = not at all, 9=very much
Needed 1 = not at all, 9=very much
Informative 1 = not at all, 9=very much

Willingness to share
How much would you like to share information about RecipeWatch with your friends? 1= not at all, 9 = quite a bit
How likely would you recommend RecipeWatch to others? 1= not at all, 9 = quite a bit
To what extent do you agree with the statements below:
RecipeWatch would help me cook healthier. 1 = totally disagree, 7 = totally agree
RecipeWatch would help me cook more sustainably. 1 = totally disagree, 7 = totally agree
RecipeWatch would motivate me to cook at home more often. 1 = totally disagree, 7 = totally agree

The first part of the questionnaire is complete. In the next section, we would like to learn more about you as an individual.

MODERATORS [T3.2 nationality, religion, culture, regionality, and seasonality]
SEASONAL FOOD ORIENTATION
Please read the statements about your diet below and indicate your agreement. (7-point scale, where 1 = totally disagree; 7 = totally agree)

- I believe seasonal vegetables taste better than out-of-season produce
- I believe seasonal foods have a fresher taste compared to non-seasonal options
- Eating seasonal foods is an important part of my diet
- I prefer to eat foods that are naturally available during their peak season

CULTURAL ASPECTS OF NUTRITION
Please read the statements below and indicate your agreement. (7-point scale, where 1 = totally disagree; 7 = totally agree)

- Food is a central part of my family's traditions and celebrations.
- I tend to participate in preparing traditional dishes for special occasions.
- I am knowledgeable about the food-related customs of my culture.
- I enjoy learning about and trying dishes from other cultures.
- My culinary practices have been influenced by the foods of other regions.
- I see food as a way to bridge cultural differences and foster understanding.

REGIONAL ASPECTS OF NUTRITION
LOCAVORISM shortened
Please read the statements below and indicate your agreement. (7-point scale, where 1 = totally disagree; 7 = totally agree)

- Locally produced foods just taste better.
- Locally produced foods are more nutritious than foods that have been shipped from somewhere else.
- Locally produced food has a lower environmental impact.

Cooking-related Ambivalence
Please indicate the extent to which the following words describe your feelings toward changing your cooking habits to become healthier. (5-point scale, where 0 means „don't harbor this feeling", 1 means „slightly" and 5 „extremely")

- Conflicted
- Mixed

- Indecision

Please indicate the extent to which the following words describe your feelings toward changing your cooking habits to become more sustainable (5-point scale, where 0 means „don't harbor this feeling", 1 means „slightly" and 5 „extremely")

- Conflicted
- Mixed
- Indecision

During the last 12 months, was there a time when, because of a lack of money:

- You were worried you would not have enough food to eat? 1 = totally disagree; 7 = totally agree
- You were unable to eat healthy and nutritious food?
- You ate only a few types of foods?
- Your household ran out of food?

Imagine that today you do not want to cook for yourself, and instead you decide to order a meal either like the one in the recipe shown at the beginning of the questionnaire, or something else that you would like.

Please choose a delivery method that you would prefer:

- Climate-friendly delivery (by bicycles, electric cargo bikes, electric vehicles, walking couriers)
- Conventional delivery using standard cars
- Collecting the order from a pick-up point myself

What might motivate you to collect your order from a nearby pick-up point. 1 = Strongly disagree; 7 = Strongly agree

- I would choose a pick-up point because it is more convenient for me.
- I would choose a pick-up point to avoid paying delivery charges.
- I would choose a pick-up point because it is better for the environment.

Control questions
What is your diet type:

- Meat-based diet
- Flexitarian
- Vegetarian
- Vegan
- Pescatarian
- I do not follow any diet
- Other [please specify]

How often do you cook at home?

- Every day
- Almost every day
- Several times a week
- About once a week
- Occasionally (a few times a month)

- Rarely (less than once a month)
- Never

[skip for those who answer never previously] How often do you use recipes when cooking meals?

- Every day
- Almost every day
- Several times a week
- About once a week
- Occasionally (a few times a month)
- Rarely (less than once a month)
- Never

Please evaluate how confident you feel in your knowledge regarding: 1 = not confident at all, 7 = very confident

- Healthy cooking
- Sustainable cooking

Price consciousness (Koschate-Fischer et al., 2012)
1 strongly disagree; 7 strongly agree

- I buy groceries mainly when they are on sale.
- Price is the most important factor for me when choosing food.

Do you cook similar meals to the recipe you saw at the beginning of this study?

- Usually
- Occasionally
- Rarely
- Never

Please indicate how tasty you expect the dish described at the beginning of the questionnaire to be after adopting the recommendation.
1 = not tasty at all; 9 = very tasty
Please indicate how tasty you expect the dish described at the beginning of the questionnaire to be without adopting the recommendation. 1 = not tasty at all; 9 = very tasty

What was the name of the new online tool mentioned at the beginning of the questionnaire?

- MealWatch
- RecipeFlow
- RecipeWatch
- FoodWatch

Demographics
Please select the highest level of education you have achieved to date:

- Secondary education
- Post-secondary non-tertiary education (vocational)
- Tertiary Education
- University Degree

Occupation

- Self-employed
- Employed professional
- Skilled Manual Worker
- Unskilled Manual Worker
- Agricultural Worker
- Homemaker
- Student
- Retired (with previous occupation),
- Unemployed

What is your ethnic background? Please indicate the cultural group with which you most closely identify.

Belgium	Greece	Lithuania	United Kingdom
• Dutch-speaking Belgian • French-speaking Belgian • Other European (e.g., Italian, Polish, etc.) • Moroccan • Turkish • Mixed/Multiple ethnic groups • Other (please specify) • Prefer not to disclose	• Greek • Albanian • Roma (Romani) • Aromanians • Other European (e.g., Italian, Polish, etc.) • Arvanites • Turkish • Pomaks • Mixed/Multiple ethnic groups • Other (please specify) • Prefer not to disclose	• Lithuanian • Polish • Russian • Belarusian • Mixed/Multiple ethnic groups • Other (please specify) • Prefer not to disclose	• English • Scottish • Welsh • Northern Irish • Polish • South Asian • Mixed/Multiple ethnic groups • Other (please specify) • Prefer not to disclose

Do you consider yourself to be:

- Christian
- Muslim
- Jewish
- Hindu
- Buddhist
- Sikh
- Atheist
- Agnostic / Non-believer
- Other
- Don't know
- Prefer not to say

Please indicate your gender:

- Male
- Female
- Other
- Prefer not to say

Please indicate your age [insert]

The data quality of this study is very important to us. Bad-quality data could lead to incorrect conclusions. Therefore, we would like to know whether we can trust your answers.

Did you answer all the questions seriously?

We would appreciate your honest response. We will not penalize your participation, even if you indicate "No."

Yes/No

Appendix 2. Full questionnaire for the evaluation of the applicability of the 8B dimensions

Intro

We invite you to participate in an expert review process, which supports the development of behavioural interventions for the DietWise WP3 Task 3.1. Research Context and Aim This research aims to evaluate the applicability of the 8B dimensions of accessibility on a series of proposed communication messages. These messages will serve as interventions in a large-scale experiment designed to assess their effectiveness on sustainable cooking choices. Your Task We request your expert judgment to rigorously assess the performance of each intervention against the specifications outlined in the 8B dimensions of accessibility framework. First, you will be presented with two examples of an intervention to familiarise you with the context. After this preparatory section, you will proceed to the main task: evaluating the initial pool of communication messages. You will be presented with a total of 51 interventions. For each message, you are asked to provide your expert rating based on the applicability of the 8B dimensions of accessibility criteria. Please follow the detailed instructions provided in the questionnaire to complete your ratings. We sincerely appreciate your cooperation and valuable contribution to this critical stage of our research!

This is an example of an experimental intervention. Participants will be presented with a recipe recommendation that involves changing an unsustainable ingredient to a more sustainable one. Each recommendation will be reinforced with a specific communication message (e.g., a tiny tweak for a better meal - why not start with this small switch). Your core task is to evaluate the applicability of the 8B dimensions, specifically regarding this accompanying communication message.
Intervention image presented.

IntroSocialNorms You will now be presented with communication messages based on Social norms techniques. For each item rate:

1. How well does this intervention align with the specific 8Bs dimension - Usability (1), Affordability (2), Reliability (3), Availability (4), Reachability(5), Comprehensibility (6), Publicity (7), Empathy (8). Where 1= Not at all aligned; 5= Very well aligned
2. Please indicate if the 8Bs dimensions are not applicable.
3. Please leave your comments.

1SN Social norms interventions

1. Most RecipeWatch users accept this recommendation.
2. 75% of RecipeWatch users accept this recommendation.
3. Most RecipeWatch users like this recommendation.
4. Most RecipeWatch users reduce such ingredients.
5. Most RecipeWatch users make an effort to minimize such ingredients.
6. Join the 75% who accept this recommendation.
7. Most RecipeWatch users accept — benefiting themselves and others too.
8. More and more RecipeWatch users are accepting this recommendation.

9. RecipeWatch users are changing: more and more are accepting recommendations
10. 63% accepted this recommendation, up from 52% last month.
11. Acceptance of this recommendation has been increasing over time.
12. Most RecipeWatch users accept this recommendation. Choose a better ingredient!
13. Most RecipeWatch users approve and accept this recommendation.
14. Most RecipeWatch users approve our app, and nearly 75% accept our recommendations.
15. Choose a better ingredient option.

IntroOmega You will now be presented with communication messages based on Omega techniques. For each item rate: How well does this intervention align with the specific 8Bs dimension? 1= Not at all aligned ; 5= Very well aligned

1. How well does this intervention align with the specific 8Bs dimension - Usability (1), Affordability (2), Reliability (3), Availability (4), Reachability (5), Comprehensibility (6), Publicity (7),"Empathy" (8). Where 1= Not at all aligned; 5= Very well aligned
2. Please indicate if the 8Bs dimensions are not applicable.
3. Please leave your comments.

O1 Omega interventions

1. Why not go for the better option?
2. Why settle for ordinary when you can have better?
3. Your future self will thank you for this simple swap - why not start now.
4. Imagine looking back and knowing you made the better choice - why not start here?
5. We guarantee you won't miss the old ingredients. Healthiness guaranteed
6. It's a bit less familiar but worth trying.
7. It's a little different, but give it a shot!
8. It's a little different, but give it a shot!
9. Yes, it's different—but different can be better!
10. You are worth a better version
11. A recipe as thoughtful as you are— better for you.
12. The more you know, the easier it gets—you're in control of your ingredients.
13. With every recipe tweak, you're becoming an expert!
14. We're here to empower you—try this simple swap and see the impact yourself!
15. You have a great eye for recipes - this small change will make it even better
16. Your expertise in cooking at home makes you the perfect person to try this swap!
17. As someone who cares about great food choices, you'll appreciate this smart swap!
18. You might not want to replace recipe ingredients, but change might lead to something better
19. You might feel hesitant to replace familiar ingredients. But you might like it.

Alpha Intro You will now be presented with communication messages based on Alpha techniques. For each item rate: How well does this intervention align with the specific 8Bs dimension? 1= Not at all aligned ; 5= Very well aligned

1. How well does this intervention align with the specific 8Bs dimension - Usability (1), Affordability (2), Reliability (3), Availability (4), Reachability (5), Comprehensibility (6), Publicity (7), "Empathy" (8). Where 1= Not at all aligned; 5= Very well aligned
2. Please indicate if the 8Bs dimensions are not applicable.
3. Please leave your comments.

A1 Alpha interventions
1. We're doing our part for better diets. Can we count on you?
2. We did our part, what about you? Try this easy swap!
3. Free pro tip for you: swap this one ingredient.
4. Enjoy this quick and free enhancement to your recipe.
5. Step up and make the switch to better food ingredients today.
6. Commit to a better recipe today.
7. Start small: try to replace one ingredient in this recipe
8. Swap one product in your recipe. It's that simple.
9. A tiny tweak for a better meal - why not start with this small switch?
10. Here's a tiny upgrade to make your meal even better
11. This suggestion is recommended by influencer X.
12. This suggestion is made by doctor/ nutritionist (famous in the country)
13. Recommended by RecipeWatch healthy diet experts
14. Kudos for cooking at home! You are going to love this suggestion!
15. Recipe watch hero's, you are gonne love it.
16. Thanks for looking after yourself by continuing to cook at home.
17. This is our users' favorite recommendation.

Q60 Please enter your institution.

6 You have finished rating interventions. If you have any further comments or want to point out other ways how to capture the 8B dimensions of accessibility, indicate your comments here:

Appendix 3.1 Social norms intervention assessment on alignment with the specific 8Bs dimensions

	N	Mean
1. Most RecipeWatch users accept this recommendation.	1	1,8750
2. 75% of RecipeWatch users accept this recommendation	1	2,6250
3. Most RecipeWatch users like this recommendation	1	1,8750
4. Most RecipeWatch users reduce such ingredients.	1	2,0000

5. Most RecipeWatch users make an effort to minimize such ingredients	1	,0000
6. Join the 75% who accept this recommendation.	1	2,2500
7. Most RecipeWatch users accept — benefiting themselves and others too.	1	2,0000
8. More and more RecipeWatch users are accepting this recommendation.	1	2,6250
9. RecipeWatch users are changing: more and more are accepting recommendations.	1	2,2500
10. 63% accepted this recommendation, up from 52% last month.	1	3,1250
11. Acceptance of this recommendation has been increasing over time.	1	2,0000
12. Most RecipeWatch users accept this recommendation. Choose a better ingredient!	1	2,0000
13. Most RecipeWatch users approve and accept this recommendation	1	2,7500
14. Most RecipeWatch users approve our app, and nearly 75% accept our recommendations.	1	2,6250
Valid N (listwise)	1	

Appendix 3.2 Alpha intervention assessment on alignment with the specific 8Bs dimensions

	N	Mean
1. We're doing our part for better diets. Can we count on you?	1	2,2500
2. We did our part, what about you? Try this easy swap!	1	1,8750
3. Free pro tip for you: swap this one ingredient	1	2,1250
4. Enjoy this quick and free enhancement to your recipe	1	2,0000
5. Step up and make the switch to better food ingredients today.	1	2,7500
6. Commit to a better recipe today	1	2,3750
7.Start small: try to replace one ingredient in this recipe	1	3,8750
8. Swap one product in your recipe. It's that simple	1	3,6250

9. A tiny tweak for a better meal - why not start with this small switch?	1	3,7500
10. Here's a tiny upgrade to make your meal even better.	1	4,1250
11. This suggestion is recommended by influencer X.	1	3,7500
12. This suggestion is made by doctor/ nutritionist (famous in the country)	1	2,0000
13. Recommended by RecipeWatch healthy diet experts	1	3,6250
14. Kudos for cooking at home! You are going to love this suggestion!	1	3,7500
15. Recipe watch hero's, you are gonna love it	1	1,5000
16. Thanks for looking after yourself by continuing to cook at home.	1	4,2500
17. This is our users' favorite recommendation	1	4,0000
Valid N (listwise)	1	

Appendix 3.3 Omega intervention assessment on alignment with the specific 8Bs dimensions

	N	Mean
1. Why not go for the better option?	1	2,1250
2. Why settle for ordinary when you can have better?	1	2,3750
3. Your future self will thank you for this simple swap - why not start now.	1	2,7500
4. Imagine looking back and knowing you made the better choice - why not start here?	1	2,2500
5. We guarantee you won't miss the old ingredient!	1	2,6250
6. Healthiness guaranteed	1	2,1250
7. It's a bit less familiar but worth trying.	1	2,8750
8. It's a little different, but give it a shot!	1	3,6250
9. Yes, it's different—but different can be better!	1	3,6250
10. You are worth a better version	1	1,8750
11. A recipe as thoughtful as you are— better for you.	1	3,3750
12. The more you know, the easier it gets—you're in control of your ingredients.	1	3,1250
13. With every recipe tweak, you're becoming an expert!	1	3,0000

14. We're here to empower you—try this simple swap and see the impact yourself!	1	3,2500
15. You have a great eye for recipes - this small change will make it even better	1	3,1250
16. Your expertise in cooking at home makes you the perfect person to try this swap!	1	3,1250
17. As someone who cares about great food choices, you'll appreciate this smart swap!	1	3,1250
18. You might not want to replace recipe ingredients, but change might lead to something better	1	2,3750
19. You might feel hesitant to replace familiar ingredients. But you might like it.	1	3,2500
Valid N (listwise)	1	

Appendix 4. Results of the Non-Parametric Friedman Test for Ranking Interventions Within Each Technique Category

Categories			Alpha techniques	Ranking results	
Reciprocity	Reciprocity by proxy	A1	We're doing our part for better diets. Can we count on you?	A9	14.0625
		A2	We did our part, what about you? Try this easy swap!	A7	12.75
	"Free Gift" or Favor	A3	Free pro tip for you: swap this one ingredient	A8	12.6875
		A4	Enjoy this quick and free enhancement to your recipe	A13	11.125
Commitment	Commitment	A5	Step up and make the switch to better food ingredients today.	A12	10.9375
		A6	Commit to a better recipe today	A11	10.5625
	Foot-in-the-door	A7	Start small: try to replace one ingredient in this recipe	A10	10.375
		A8	Swap one product in your recipe. It's that simple	A17	10
		A9	A tiny tweak for a better meal - why not start with this small switch?	A14	9.875
		A10	Here's a tiny upgrade to make your meal even better.	A5	9.75
Authority	Credibility	A11	This suggestion is recommended by influencer X.	A6	8.5
		A12	This suggestion is made by doctor/ nutritionist (famous in the country)	A3	7
	Self-declared expertise	A13	Recommended by RecipeWatch healthy diet experts	A4	6.875

Liking		A14	Kudos for cooking at home! You are going to love this suggestion!	A1	5.75
		A15	Recipe watch hero's, you are gonne love it	A2	5.125
		A16	Thanks for looking after yourself by continuing to cook at home.	A15	4.25
Social proof		A17	This is our users' favorite recommendation	A16	3.375

Categories			Omega techniques	Ranking results	
Sidestep resistance	Raise the comparison	O1	Why not go for the better option?	O1	13.94
		O2	Why settle for ordinary when you can have better?	O10	12.81
	Pushing the choice into the future	O3	Your future self will thank you for this simple swap - why not start now	O8	12.38
		O4	Imagine looking back and knowing you made the better choice - why not start here?	O2	12.13
Address resistance directly	Guarantees	O5	We guarantee you won't miss the old ingredient!	O6	12
		O6	Healthiness guaranteed	O3	11.88
	Counterarguing resistance	O7	It's a bit less familiar but worth trying.	O17	11.38
		O8	It's a little different, but give it a shot!	O5	11.31
		O9	Yes, it's different—but different can be better!	O9	11.25
Address resistance indirectly	Raise self-esteem	O10	You are worth a better version	O7	11.06
		O11	A recipe as thoughtful as you are—better for you	O4	10.94
	Focusing resistance - training people on the subject	O12	The more you know, the easier it gets—you're in control of your ingredients.	O14	9.88
		O13	With every recipe tweak, you're becoming an expert!	O15	9.75
		O14	We're here to empower you—try this simple swap and see the impact yourself!	O13	8.19
	Focusing resistance - changing roles	O15	You have a great eye for recipes - this small change will make it even better	O19	7.13
		O16	Your expertise in cooking at home makes you the perfect person to try this swap!	O11	6.44
		O17	As someone who cares about great food choices, you'll appreciate this smart swap!	O18	6.13
Use resistance to promote change	Acknowledging resistance	O18	You might not want to replace recipe ingredients, but change might lead to something better	O16	5.94
		O19	You might feel hesitant to replace familiar ingredients. But you might like it.	O12	5.5

Categories		Social Norms techniques	Ranking results	
Descriptive norms	R1	Most RecipeWatch users accept this recommendation.	R6	11.72
	R2	75% of RecipeWatch users accept this recommendation.	R1	10.78

	R3	Most RecipeWatch users like this recommendation.	R2	10.06
	R4	Most RecipeWatch users reduce such ingredients.	R11	9.83
	R5	Most RecipeWatch users make an effort to minimize such ingredients.	R3	8.89
	R6	Join the 75% who accept this recommendation.	R12	8.17
	R7	Most RecipeWatch users accept — benefiting themselves and others too.	R8	7.83
Dynamic norms	R8	More and more RecipeWatch users are accepting this recommendation.	R4	7.33
	R9	RecipeWatch users are changing: more and more are accepting recommendations.	R9	7.17
	R10	63% accepted this recommendation, up from 52% last month.	R13	6.89
	R11	Acceptance of this recommendation has been increasing over time.	R14	6.78
Descriptive and injunctive	R12	Most RecipeWatch users accept this recommendation. Choose a better ingredient!	R15	6.78
	R13	Most RecipeWatch users approve and accept this recommendation.	R7	6.33
	R14	Most RecipeWatch users approve our app, and nearly 75% accept our recommendations.	R5	6.11
Injunctive	R15	Choose a better ingredient option	R10	5.33

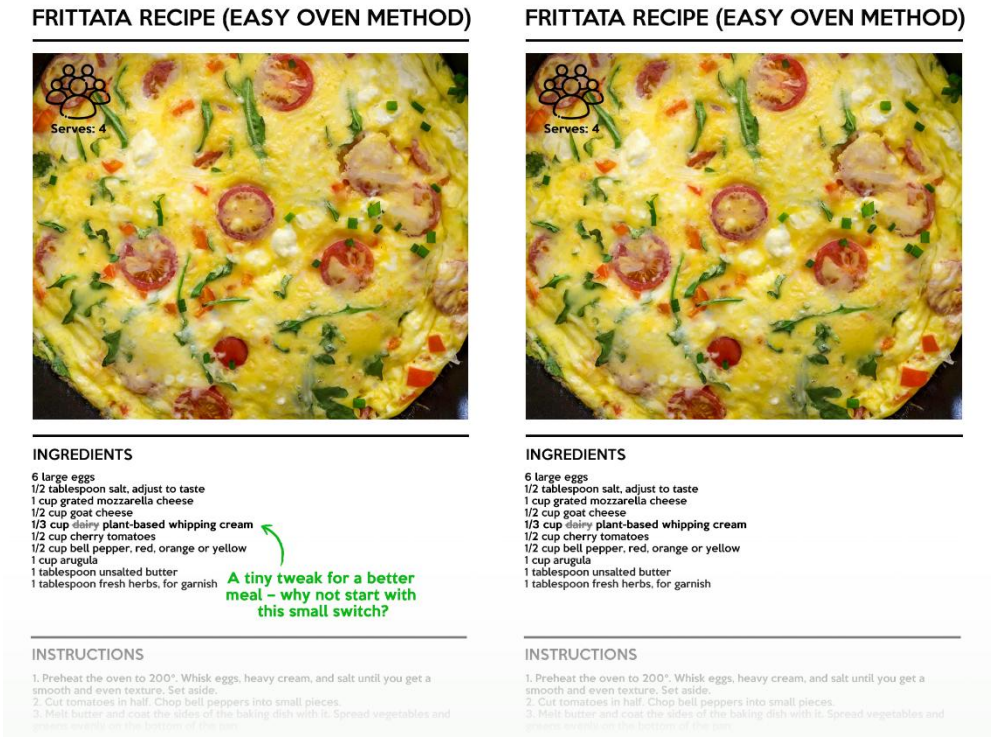
The final list of interventions

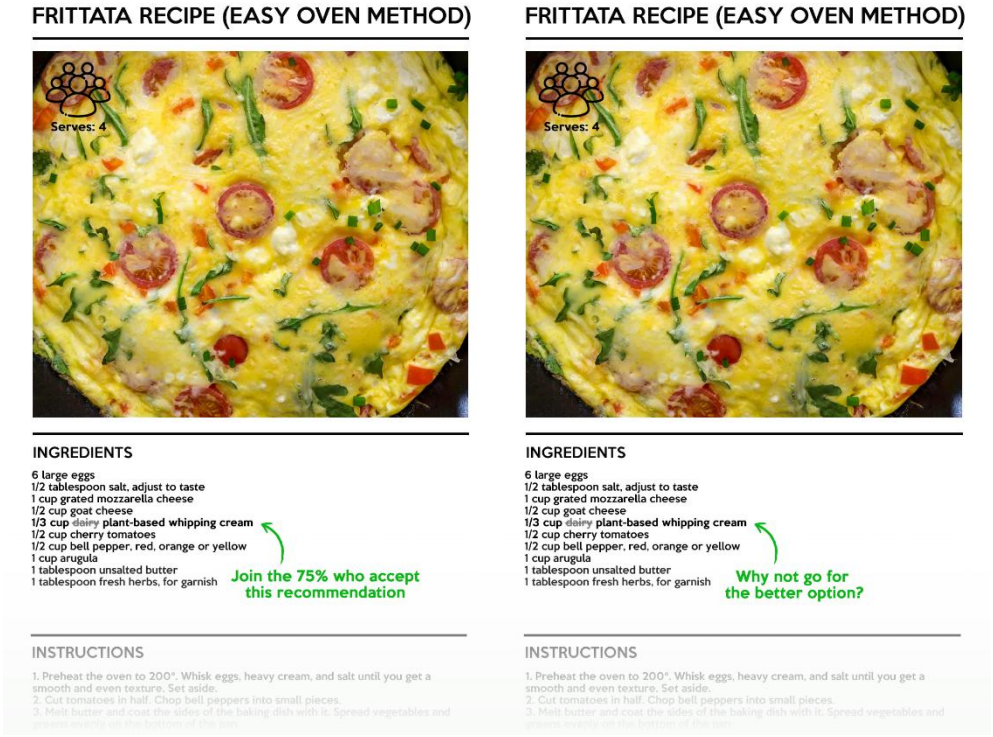
THE LIST OF FINAL INTERVENTIONS	
1	Join the 75% who accept this recommendation.
2	Acceptance of this recommendation has been increasing over time.
3	Most RecipeWatch users accept this recommendation. Choose a better ingredient!
4	Choose a better ingredient option.
5	We're doing our part for better diets. Can we count on you?
6	Free pro tip for you: swap this one ingredient.
7	Step up and make the switch to better food ingredients today.
8	A tiny tweak for a better meal - why not start with this small switch?
9	This suggestion is made by dr. Hazel Wallace. This suggestion is made by doctor/ nutritionist (famous in the country)
10	Recommended by RecipeWatch healthy diet experts.
11	Kudos for cooking at home! You are going to love this suggestion!
12	This is our users' favorite recommendation.
13	Why not go for the better option?
14	Your future self will thank you for this simple swap - why not start now?
15	Healthiness guaranteed.
16	It's a little different, but give it a shot!
17	You are worth a better version.
18	We're here to empower you - try this simple swap and see the impact yourself!

19	As someone who cares about great food choices, you'll appreciate this smart swap!
20	You might feel hesitant to replace familiar ingredients. But you might like it.

THE LIST OF FINAL RECIPES		
CHICKEN POTATO CASSEROLE	CARROT PANCAKES	EASY SPAGHETTI BOLOGNESE
INGREDIENTS 5 potatoes 3 tablespoons olive oil 1 1/3 teaspoon smoked paprika 1 tablespoon garlic powder ~~800 g chicken breasts~~ 1 teaspoon salt 1 teaspoon pepper 2 cups cheddar cheese 1/2 cup cooked crumbled bacon 2 green onions 400 g chicken breasts and 400 g vegetables INSTRUCTIONS 1. Place cubed chicken and potatoes in a large bowl. 2. Whisk together oil and seasonings and add to the chicken mixture. Stir till well combined. 3. Pour into a greased pan. Bake uncovered at 200° for 50-55 minutes or till potatoes are tender. 4. Sprinkle cheese, bacon, and green onion on top. Bake for 5 more minutes.	Serves: 4-6 INGREDIENTS ~~2 cups milk~~ 2 eggs 1/4 cup butter 4 medium carrots, chopped 2 cups white flour 2 teaspoons baking powder 1 teaspoon salt 4 tablespoons sugar 2 dashes nutmeg 2 dashes cinnamon 2 cups plant-based milk INSTRUCTIONS 1. Blend milk, eggs, and butter briefly. 2. Add carrots and blend until smooth. 3. Add flour, baking powder, salt, and sugar; blend until combined. 4. Mix in nutmeg and cinnamon for 1 minute. 5. If the batter is too thin, add 1-2 tablespoons of flour. 6. Heat a greased pan over medium heat and cook pancakes until golden brown.	Serves: 4 INGREDIENTS 2 tablespoons olive oil 1 onion, diced 2 garlic cloves, chopped 100 g carrot, grated ~~400 g beef mince~~ 2 x 400 g tins chopped tomatoes 400 ml stock (made from a stock cube. Ideally beef, but any will do) 400 g dried spaghetti salt and pepper 200 g beef mince and 200 g vegetables INSTRUCTIONS 1. Heat a large saucepan over a medium heat, add oil, then brown the mince with salt and pepper. Set aside. 2. Add more oil, fry onions with salt for 5-6 minutes until soft. Add garlic for 2 minutes, then carrot. 3. Return mince to the pan, add tomatoes and stock. Simmer for 45 minutes until thick. Adjust seasoning. 4. Cook spaghetti in salted water as per packet instructions. Drain, mix with sauce and serve.

Appendix 5. Experimental Interventions in Pilot Study 2


FRITTATA RECIPE (EASY OVEN METHOD)
Serves: 4
INGREDIENTS
6 large eggs
1/2 tablespoon salt, adjust to taste
1 cup grated mozzarella cheese
1/2 cup goat cheese
1/3 cup ~~dairy~~ plant-based whipping cream
1/2 cup cherry tomatoes
1/2 cup bell pepper, red, orange or yellow
1 cup arugula
1 tablespoon unsalted butter
1 tablespoon fresh herbs, for garnish
A tiny tweak for a better meal – why not start with this small switch?
INSTRUCTIONS
1. Preheat the oven to 200°. Whisk eggs, heavy cream, and salt until you get a smooth and even texture. Set aside.
2. Cut tomatoes in half. Chop bell peppers into small pieces.
3. Melt butter and coat the sides of the baking dish with it. Spread vegetables and
FRITTATA RECIPE (EASY OVEN METHOD)
Serves: 4
INGREDIENTS
6 large eggs
1/2 tablespoon salt, adjust to taste
1 cup grated mozzarella cheese
1/2 cup goat cheese
1/3 cup ~~dairy~~ plant-based whipping cream
1/2 cup cherry tomatoes
1/2 cup bell pepper, red, orange or yellow
1 cup arugula
1 tablespoon unsalted butter
1 tablespoon fresh herbs, for garnish
INSTRUCTIONS
1. Preheat the oven to 200°. Whisk eggs, heavy cream, and salt until you get a smooth and even texture. Set aside.
2. Cut tomatoes in half. Chop bell peppers into small pieces.
3. Melt butter and coat the sides of the baking dish with it. Spread vegetables and


FRITTATA RECIPE (EASY OVEN METHOD)
Serves: 4
INGREDIENTS
6 large eggs
1/2 tablespoon salt, adjust to taste
1 cup grated mozzarella cheese
1/2 cup goat cheese
1/3 cup ~~dairy~~ plant-based whipping cream
1/2 cup cherry tomatoes
1/2 cup bell pepper, red, orange or yellow
1 cup arugula
1 tablespoon unsalted butter
1 tablespoon fresh herbs, for garnish
Join the 75% who accept this recommendation
INSTRUCTIONS
1. Preheat the oven to 200°. Whisk eggs, heavy cream, and salt until you get a smooth and even texture. Set aside.
2. Cut tomatoes in half. Chop bell peppers into small pieces.
3. Melt butter and coat the sides of the baking dish with it. Spread vegetables and
FRITTATA RECIPE (EASY OVEN METHOD)
Serves: 4
INGREDIENTS
6 large eggs
1/2 tablespoon salt, adjust to taste
1 cup grated mozzarella cheese
1/2 cup goat cheese
1/3 cup ~~dairy~~ plant-based whipping cream
1/2 cup cherry tomatoes
1/2 cup bell pepper, red, orange or yellow
1 cup arugula
1 tablespoon unsalted butter
1 tablespoon fresh herbs, for garnish
Why not go for the better option?
INSTRUCTIONS
1. Preheat the oven to 200°. Whisk eggs, heavy cream, and salt until you get a smooth and even texture. Set aside.
2. Cut tomatoes in half. Chop bell peppers into small pieces.
3. Melt butter and coat the sides of the baking dish with it. Spread vegetables and

Appendix 6. Pilot Study 2 Scenario

Dear Participants,

Welcome to our study. In this study, you will be asked to read a few recipes and answer questions. We seek to investigate how people process information and make decisions. You will need around 10 minutes to complete this study.

Participation in this study is entirely voluntary; you are under no obligation to take part. If you decide to take part, you will be asked to accept this form by clicking on the button underneath. You have the right to withdraw from the study at any time and without giving a reason.

Anonymity and data confidentiality: The information you provide will be confidential. Once the data is analyzed, a report of findings may be submitted for publication. Only broad trends will be reported, and it will not be possible to identify any individuals.

If you have any questions or require any further information, please contact one of the researchers.
Ebo Botchway (ebo.botchway@kuleuven.be)
Elze Uzdavinyte(elze@adcogito.lt)

By clicking "I agree to participate", you acknowledge that you have read and understood the information provided above, and have received an answer to all your questions regarding this study.
I agree
I do not agree

[page break]
Thank you very much for taking part in our study!
Please enter your Prolific ID below:
(Please note that this response should auto-fill with the correct ID.)

[page break]

Let us introduce RecipeWatch – a new online tool that helps consumers make healthier and more sustainable food choices. Following RecipeWatch advice means preparing meals that benefit your health, the planet, your wallet, and your community. It involves using fresh, seasonal, and locally available foods, adding more vegetables, saving energy while cooking, and reducing food waste. RecipeWatch scans any online recipe a user is viewing and provides suggestions for healthier and more sustainable alternatives. If a recipe includes ingredients that are less healthy or less sustainable, users will see simple recommendations for improvements. They can choose to accept or dismiss these suggestions.

[page break]

Now, imagine that you are cooking using this new tool, RecipeWatch. Please read the following recipe and answer some questions.

[Manipulations insert]

MAIN DV:
Accept/Dismiss

AFTER ALL THE RECIPES ARE SHOWN: secondary DV's

Behavioral intentions
How much would you like to use RecipeWatch if it was free of charge? 1 = not at all, 9=quite a bit

Perceived usefulness
To what extent do you find the RecipeWatch recommendations for you personally...

Useful 1 = not at all, 9=very much
Needed 1 = not at all, 9=very much
Informative 1 = not at all, 9=very much_____

MODERATORS

How much of the following items is thrown away in your household in a regular week:
Hardly Any, Less than 10%, Between 10% and 25%, Between 25% and 50%, More than 50%
Food
Milk and dairy products
Fresh fruits and vegetables
Meat and fish
Bread and other bakery products

Please indicate how much you agree with the following statements about how you usually handle leftovers.
The leftovers are usually eaten as such or just reheated when used again 1 = strongly disagree, 7=strongly agree
The leftovers are usually transformed into a different dish by adding some ingredients before eating them 1 = strongly disagree, 7=strongly agree
The leftovers are stored in appropriate conditions so they will last 1 = strongly disagree, 7=strongly agree
Usually, I throw away leftovers 1 = strongly disagree, 7=strongly agree

Please answer the following questions thinking about the near future (e.g., next one/two weeks) and your household.
I intend not to throw food away 1 = strongly disagree, 7=strongly agree
My goal is not to throw food away 1 = strongly disagree, 7=strongly agree
I will try not to throw food away 1 = strongly disagree, 7=strongly agree

Please indicate how much you agree with the following statements about how you treat plastic waste.
I make an effort to reduce my plastic waste in my daily living.1 = strongly disagree, 7=strongly agree
Thinking back over the past few weeks, I have reduced a great deal of plastic waste. 1 = strongly disagree, 7=strongly agree

Please indicate how much you agree with the following statements about your future intentions towards plastics.

Thinking of my next purchase, I plan to buy fresh products (e.g., milk, yoghurt) that come in glass instead of plastic.1 = strongly disagree, 7=strongly agree
Thinking of my next purchase, I plan to put food into several containers I bring with me.1 = strongly disagree, 7=strongly agree
Thinking of my next purchase, I plan to avoid buying fruits and vegetables that are wrapped in plastic.1 = strongly disagree, 7=strongly agree

Please indicate how much you agree with the following statements about your future intentions towards food delivery.
I look for meal delivery services that offer climate-friendly delivery.1 = strongly disagree, 7=strongly agree
I prefer meal delivery services that use bicycles, electric cargo bikes, electronic vehicles or walking couriers over cars or vans.1 = strongly disagree, 7=strongly agree
I prefer picking up orders at a nearby location if it reduces environmental impact.1 = strongly disagree, 7=strongly agree

Control questions

What is your diet type:
Meat-based diet
Flexitarian
Vegetarian
Vegan
Pescatarian
I do not follow any diet
Other [please specify]

How often do you cook at home?
Every day
Almost every day
Several times a week
About once a week
Occasionally (a few times a month)
Rarely (less than once a month)
Never

[skip for those who answer never previously] How often do you use recipes when cooking meals?
Every day
Almost every day
Several times a week
About once a week
Occasionally (a few times a month)
Rarely (less than once a month)
Never
Please evaluate how confident you feel in your knowledge regarding: 1 = not confident at all, 7 = very confident
Healthy cooking
Sustainable cooking

Please indicate your gender:
Male
Female
Other
Prefer not to say

Please indicate your age [insert]

Please evaluate your knowledge of English: 1 = basic; 9 = fluent

The data quality of this study is very important to us. Bad-quality data could lead to incorrect conclusions. Therefore, we would like to know whether we can trust your answers.

Did you answer all the questions seriously?

We would appreciate your honest response. We will not penalize your participation, even if you indicate "No."
Yes/No

Appendix 7. Pairwise Comparisons of Predicted Probabilities Between Groups, by Recipe in Pilot Study 2

Recipe	Group	Contrast	std. err.	z	P>z	[95% conf.	interval]
Carrot Pancake	Alpha vs Control	-0.060	0.099	-0.60	0.549	-0.255	0.135
	Norm vs Control	0.060	0.091	0.66	0.507	-0.118	0.238
	Omega vs Control	0.001	0.097	0.01	0.990	-0.190	0.192
	Norm vs Alpha	0.120	0.093	1.29	0.197	-0.062	0.302
	Omega vs Alpha	0.061	0.100	0.61	0.541	-0.134	0.256
	Omega vs Norm	-0.059	0.091	-0.65	0.515	-0.237	0.119
Chicken Casserole	Alpha vs Control	0.158	0.095	1.66	0.097	-0.029	0.346
	Norm vs Control	0.159	0.095	1.67	0.094	-0.027	0.346
	Omega vs Control	0.187	0.093	2.03	0.043	0.006	0.369
	Norm vs Alpha	0.001	0.086	0.01	0.991	-0.167	0.169
	Omega vs Alpha	0.029	0.083	0.35	0.727	-0.133	0.191
	Omega vs Norm	0.028	0.082	0.34	0.734	-0.134	0.190

Frittata	Alpha vs Control	-0.122	0.113	-1.08	0.280	-0.343	0.099
	Norm vs Control	-0.094	0.113	-0.83	0.404	-0.316	0.127
	Omega vs Control	-0.197	0.110	-1.79	0.074	-0.412	0.019
	Norm vs Alpha	0.027	0.115	0.24	0.812	-0.198	0.253
	Omega vs Alpha	-0.075	0.112	-0.67	0.506	-0.295	0.146
	Omega vs Norm	-0.102	0.113	-0.91	0.365	-0.323	0.119
Spaghetti Bolognese	Alpha vs Control	-0.113	0.112	-1.00	0.315	-0.333	0.107
	Norm vs Control	0.016	0.109	0.15	0.883	-0.198	0.230
	Omega vs Control	-0.133	0.112	-1.19	0.235	-0.352	0.086
	Norm vs Alpha	0.129	0.109	1.18	0.239	-0.086	0.343
	Omega vs Alpha	-0.020	0.112	-0.18	0.858	-0.240	0.200
	Omega vs Norm	-0.149	0.109	-1.37	0.171	-0.362	0.064

Predicted acceptance probabilities of recipes by intervention, Pilot 2

Recipe	Group	Margin	std. err.	z	P>z	[95% conf. interval]	
Carrot	Control	0.772	0.069	11.17	0.0000	0.637	0.908
	Alpha	0.713	0.072	9.86	0.0000	0.571	0.854
	Norm	0.832	0.059	14.20	0.0000	0.718	0.947
	Omega	0.773	0.069	11.17	0.0000	0.638	0.909
Chicken	Control	0.676	0.074	9.16	0.0000	0.531	0.821
	Alpha	0.835	0.061	13.69	0.0000	0.715	0.954
	Norm	0.836	0.061	13.80	0.0000	0.717	0.954
	Omega	0.864	0.056	15.34	0.0000	0.753	0.974
Frittata	Control	0.590	0.078	7.53	0.0000	0.436	0.743
	Alpha	0.468	0.081	5.75	0.0000	0.309	0.627
	Norm	0.495	0.082	6.03	0.0000	0.334	0.656
	Omega	0.393	0.078	5.04	0.0000	0.240	0.546
Spaghetti	Control	0.659	0.079	8.30	0.0000	0.504	0.815
	Alpha	0.547	0.080	6.85	0.0000	0.390	0.703
	Norm	0.675	0.075	8.96	0.0000	0.528	0.823
	Omega	0.526	0.079	6.65	0.0000	0.371	0.682

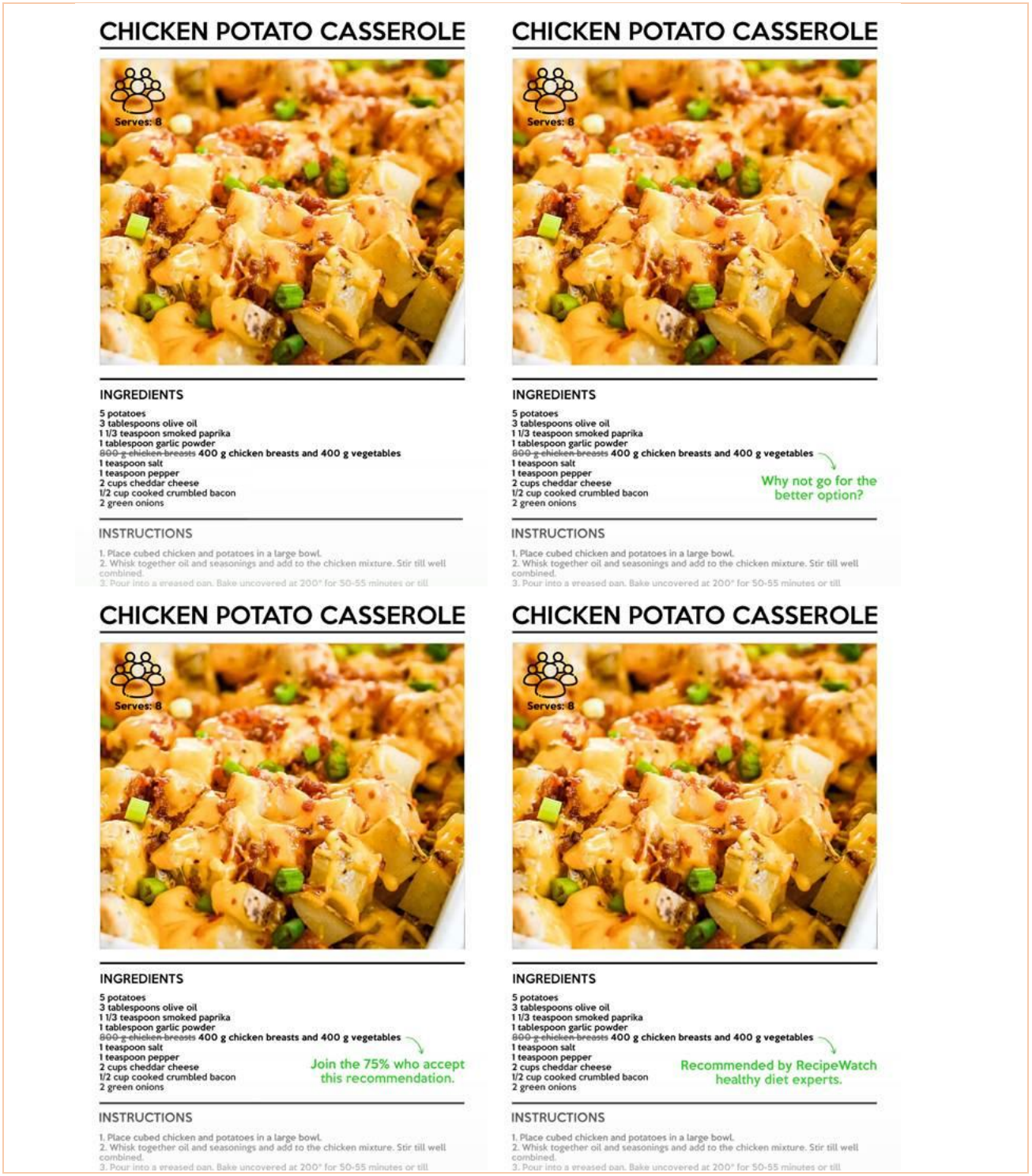
Appendix 8. Pairwise Comparisons of Predicted Probabilities Between Groups, by Recipe in Pilot Study 3

Recipe	Group	Contrast	std. err.	z	P>z	[95% conf.	interval]
Carrot Pancakes	Alpha vs Control	0.056	0.111	0.50	0.616	-0.162	0.273
	Norm vs Control	0.088	0.111	0.79	0.430	-0.130	0.305
	Omega vs Control	-0.268	0.106	-2.54	0.011	-0.475	-0.061
	Norm vs Alpha	0.032	0.108	0.29	0.769	-0.180	0.244
	Omega vs Alpha	-0.323	0.103	-3.14	0.002	-0.525	-0.121
	Omega vs Norm	-0.355	0.104	-3.43	0.001	-0.558	-0.152
Chicken Casserole	Alpha vs Control	0.069	0.109	0.64	0.525	-0.145	0.283
	Norm vs Control	0.059	0.110	0.54	0.591	-0.157	0.276
	Omega vs Control	0.026	0.110	0.23	0.815	-0.190	0.241
	Norm vs Alpha	-0.010	0.109	-0.09	0.927	-0.224	0.204
	Omega vs Alpha	-0.044	0.108	-0.40	0.687	-0.256	0.169
	Omega vs Norm	-0.034	0.110	-0.31	0.759	-0.249	0.182
Frittata	Alpha vs Control	-0.009	0.084	-0.11	0.913	-0.173	0.155
	Norm vs Control	0.004	0.084	0.05	0.957	-0.160	0.169
	Omega vs Control	-0.076	0.087	-0.88	0.379	-0.246	0.094
	Norm vs Alpha	0.014	0.086	0.16	0.874	-0.154	0.182
	Omega vs Alpha	-0.067	0.088	-0.76	0.447	-0.240	0.106
	Omega vs Norm	-0.081	0.089	-0.91	0.365	-0.255	0.094
Spaghetti Bolognese	Alpha vs Control	0.138	0.099	1.40	0.162	-0.055	0.331
	Norm vs Control	0.080	0.101	0.79	0.429	-0.118	0.277
	Omega vs Control	0.108	0.101	1.07	0.284	-0.090	0.306
	Norm vs Alpha	-0.058	0.093	-0.62	0.533	-0.241	0.125
	Omega vs Alpha	-0.030	0.094	-0.32	0.753	-0.213	0.154
	Omega vs Norm	0.029	0.096	0.30	0.765	-0.159	0.217

Predicted acceptance probabilities of recipes by intervention, Pilot Study 3

Recipe	Group	Margin	std. err	z	P>z	[95% conf.	interval]
Carrot	Control	0.532	0.081	6.59	0.000	0.374	0.690
	Alpha	0.587	0.077	7.60	0.000	0.436	0.739
	Norm	0.619	0.077	8.03	0.000	0.468	0.770
	Omega	0.264	0.069	3.81	0.000	0.128	0.400
Chicken	Control	0.569	0.079	7.23	0.000	0.414	0.723
	Alpha	0.638	0.077	8.30	0.000	0.487	0.789
	Norm	0.628	0.079	7.98	0.000	0.474	0.782
	Omega	0.594	0.078	7.65	0.000	0.442	0.746
Frittata	Control	0.842	0.058	14.48	0.000	0.728	0.956
	Alpha	0.833	0.061	13.77	0.000	0.715	0.952
	Norm	0.847	0.061	13.79	0.000	0.727	0.967
	Omega	0.766	0.065	11.80	0.000	0.639	0.893
Spaghetti	Control	0.666	0.075	8.87	0.000	0.519	0.814
	Alpha	0.804	0.065	12.43	0.000	0.677	0.931
	Norm	0.746	0.068	10.96	0.000	0.613	0.879
	Omega	0.775	0.069	11.31	0.000	0.640	0.909

Appendix 9. Experimental Interventions in Megastudy (Example for 1 recipe)



Appendix 10. Megastudy Ethical Assessment

VU FEBA Consumer Decision Making Ethical Self-Assessment Form
Ethical approval request ID: 78
1.Project title
Megastudy: Social influence interventions' effectiveness in healthy and sustainable diet choice
2.Contact person's phone number
+37061693013
3.Contact person's email address
agne.zakareviciute@evaf.vu.lt
4.Give a brief description of the project and explain research hypotheses
This study is a "megastudy" designed to empirically test the comparative efficacy of 20behavioural interventions aimed at encouraging sustainable and healthier dietary behaviours interventions are theoretically grounded in persuasion strategies such as Alpha(approach-oriented), Omega (resistance-reducing), and social norms.
Study design and procedure: Participants will be randomly assigned to one of 21 between-subjects conditions. The 20intervention conditions include 4 social norms, 8 Alpha, and 8 Omega strategy interventions, while in the control condition, no intervention is presented. In each condition, participants will be presented with a recipe recommendation to substitute unsustainable or unhealthy ingredient with sustainable and healthy alternative. Each recipe recommendation will be randomly paired with one of the 20behavioural interventions, or with no intervention in the control condition. Random assignment of interventions will ensure approximately equal exposure across all conditions. The study uses a fixed set of three distinct recipe recommendations. Each participant will first indicate their favourite recipe from three listed options, then the recommendation aligned with the assigned intervention or control condition will be provided for the recipe they selected. Following the intervention, participants will be asked to complete the dependent variable measures and several additional assessment scales. We address these questions: 1) What is the relative effectiveness of the 20 interventions when compared against one another across the dependent variables? 2) Which of these 20 interventions are statistically more effective than the control condition? 3) What intervention is the most effective within social norms, Alpha and Omega strategies?4) Which of the three persuasion techniques is the most effective in encouraging acceptance of sustainable and healthier recommendations – social norms, Alpha or Omega influence technique?
5.List responsible researcher, involved researchers and their roles
dr. Elzė Uždavinytė - researcher
dr. Živilė Kaminskienė - researcher
Agnė Zakarevičiūtė - researcher
6.Explain how and what type of data will be collected and list names of researchers responsible for data management
Primary Dependent Variable:
Participants will review a series of recipe recommendations and indicate, on a binary accept/dismiss scale, whether they would implement each recommendation. For example, in meat-based recipe, they will be asked to reduce the meat portion and add more vegetables, etc. The scale has received ethical approval (ID 52).
Secondary Dependent Variables:
We will measure four constructs related to the evaluation of the "RecipeWatch" app.

1.behavioural Intentions: Assessed using a single item: "How much would you like to use RecipeWatch if it were free of charge?" rated on a 9-point Likert scale (Ethical Approval ID 52).
2. Perceived Usefulness: A composite measure assessing the personal relevance of the recommendations via three items: whether the app is "useful," "needed," and "informative "rated on a 9-point Likert scale (Ethical Approval ID 52).
3. Willingness to Share: A composite measure averaged from two items: the inclination to share the app with friends and the likelihood of recommending it to others, rated on a 9-point Likert scale (Ethical Approval ID 52).
4. Perceived Impact on Cooking behaviour: A composite measure averaged from three items assessing participants' agreement that the app would help them: (a) cook healthier, (b) cook more sustainably, or © motivate them to cook at home more often (7-point Likert scale).
Moderators, Covariates, and Demographics (Exploratory):
As part of the exploratory analyses, we will examine whether the following individual-difference variables moderate the effect of intervention on sustainable and healthier dietary choice: Seasonal Food Orientation, Cultural Aspects of Nutrition, Regional Aspects of Nutrition(Locavorism – shortened), Cooking-Related Ambivalence, and Perceived Food Insecurity. In addition, we will collect information on participants' diet type, frequency of cooking at home, recipe use when cooking, confidence in healthy and sustainable cooking knowledge, price consciousness, similarity of own cooking to the presented recipe, expected tastiness of the dish, and food delivery preferences. These variables may be included as covariates or moderators to explore potential influences on sustainable dietarybehaviours and the effectiveness of interventions. We will also collect demographic information (education, occupation, ethnic background, religion, age, gender for descriptive purposes and exploratory subgroup analyses.
7.List categories of personal data that will be processed

- not specific personal data
- nationality
- national ID number
- race
- ethnicity
- political opinions
- physical health
- mental health
- sexual orientation
- religious beliefs
- age, gender

8.Is there a non-negligible risk involved for participants or the research in some way unpleasant for participants?

- No
- Yes / Not sure

9.Are participants selected among a normal (non-clinical and mentally competent) population?

- Yes
- No / not sure

10. Are participants under 16?
    - No
    - Yes

11. Is participation voluntarily, and can participants end their participation to the research, for whichever reason, at any point in time during the research?
    - Yes
    - No / not sure

12. Is screening of participants necessary, because the research involves a risk for some parts of the population (e.g., pregnant women, participants with certain disabilities)
    - No
    - Yes / not sure

13. Do participants receive an information brochure before participation and do they sign an informed consent form?
    - Yes
    - No

14. Please attach the information brochure and informed consent form
(Non-anonymous question) Dietwise_INFORMATION BROCHURE_anonymous 1.docx
15. Please explain the previous answer
Enter "N/A" if you indicated that participants will be provided with the information brochure and informed consent form
N/A
16. Does the research involve misleading the participants?
    - No
    - Yes

17. Do participants receive a debriefing after the research?
    - Yes
    - No

18. Please provide debriefing text as extra attachment to this request form
(Non-anonymous question)
ending_DietWise_anonymous 1.docx
19. Please explain why participants do not receive a debriefing after the research
N/A
20. Are participants' responses fully anonymous and is the privacy of participants guaranteed?
    - Yes
    - No

21. Are there any other issues that might be relevant to the IRB?
    - No
    - Yes / not sure

Appendix 11. Distribution of the Sample Across Religious Affiliation Groups

Frequencies for religion

Religion	Frequency	Percent	Valid Percent	Cumulative Percent
Christian	939	40.9	40.9	40.9
Muslim	60	2.6	2.6	43.5
Jewish	9	0.4	0.4	43.9
Hindu	13	0.6	0.6	44.4
Buddhist	13	0.6	0.6	45.0
Sikh	10	0.4	0.4	45.5
Atheist	458	19.9	19.9	65.4
Agnostic/Non-believer	681	29.6	29.6	95.0
Other	32	1.4	1.4	96.4
Prefer not to say	82	3.6	3.6	100.0
Missing	0	0.0		
Total	2297	100.0		

Appendix 12. Study 1: Exploring Motivation for Reducing Waste and Delivery Choices Measures

Results of Exploratory Factor analysis using Principal Axis Factoring and Internal Consistency Reliability (N = 150).			
Factors and items	Factor 1 Loading	Communality (h^2)	Cronbach's α
Food waste behaviour (based on Stancu et al., 2015)			0.839
Items worded as 'How much … is thrown away in your household of what you buy and/or grow, in a regular week':			
Food	0.888	0.789	

Milk and dairy products	0.648	0.419	
Fresh fruits and vegetables	0.725	0.526	
Meat and fish	0.676	0.457	
Bread and other bakery products	0.679	0.461	
Scale: hardly any (1), less than a tenth (less than 10%) (2), more than a tenth but less than a quarter (between 10% and 25%) (3), more than a quarter but less than a half (between 25% and 50%) (4), more than a half (more than 50%) (5)			
Leftovers reuse routines (adapted from Stancu et al., 2015)			0.769
Please indicate how much you agree with the following statements about how you usually handle leftovers			
The leftovers are usually eaten as such or just reheated when used again	0.782	0.612	
The leftovers are usually transformed into a different dish by adding some ingredients before eating them	0.30591	0.093	
The leftovers are stored in appropriate conditions so they will last	0.820	0.673	
Usually, I throw away leftovers (R)	0.885	0.784	
Scale: strongly disagree (1) to strongly agree (7)			
Intention not to waste food (based on Stancu et al., 2015)			0.823
Please answer the following questions thinking about the near future (e.g. next one/two weeks) and your household'			
I intend not to throw food away	0.695	0.484	
My goal is not to throw food away	0.850	0.722	
I will try not to throw food away	0.846	0.716	
Scale: strongly disagree (1) to strongly agree (7)			
Plastic waste reduction behaviour (based on Chung and Lapinski, 2023)			0.875

Please indicate how much you agree with the following statements about how you treat plastic waste			
I make an effort to reduce my plastic waste in my daily living.	0.882	0.779	
Thinking back over the past few weeks, I have reduced a great deal of plastic waste.	0.882	0.779	
Scale: strongly disagree (1) to strongly agree (7)			
Intention not to waste plastic (adapted from Heidbreder et al., 2022			0.655
Please indicate how much you agree with the following statements about your future intentions towards plastics.			
Thinking of my next purchase, I plan to buy fresh products (e.g., milk, yoghurt) that come in glass instead of plastic.	0.717737	0.515	
Thinking of my next purchase, I plan to put food into several containers I bring with me.	0.614171	0.377	
Thinking of my next purchase, I plan to avoid buying fruits and vegetables that are wrapped in plastic.	0.553675	0.306	
Scale: strongly disagree (1) to strongly agree (7)			
Sustainable delivery-related behaviours			0.76
Please indicate how much you agree with the following statements about your future intentions towards food delivery.			
I look for meal delivery services that offer climate-friendly delivery.	0.862	0.744	
I prefer meal delivery services that use bicycles, electric cargo bikes, electronic vehicles or walking couriers over cars or vans.	0.809	0.655	
I prefer picking up orders at a nearby location if it reduces environmental impact.	0.537	0.289	
Scale: strongly disagree (1) to strongly agree (7)			

Appendix 13. Correlation Table: Exploring Motivation for Reducing Waste and Delivery Choices Measures

	Intentions to use the APP	Food waste behaviour R	Leftovers reuse routines	Food waste intentions	Plastic waste behaviour	Plastic waste intention	Delivery-related behaviours	Frequency of cooking at home	Sustainable cooking knowledge	Healthy cooking knowledge	Diet type	Gender	Age
Intentions to use the APP	1												
Food waste behaviour R	-.150	1											
Leftovers reuse routines	-.112	.330**	1										
Food waste intentions	.036	.312**	.458**	1									
Plastic waste behaviour	.309**	-.107	.065	.144	1								
Plastic waste intention	.333**	-.014	.157	.097	.532**	1							

Delivery-related behaviours	.301**	-.059	.126	.070	.521**	.555**	1						
Frequency of cooking at home	-.035	-.022	-.168*	-.115	-.201*	-.104	-.014	1					
Sustainable cooking knowledge	.061	.174*	.316**	.153	.458**	.362**	.316**	-.308*	-.151				
Healthy cooking knowledge	-.116	.242**	.502**	.188*	.176*	.110	.089	-.447**	-.194*	1			
Diet type	.094	.098	.070	.077	.009	.067	.070	.072	.175*	-.033	1		
Gender	.104	.010	-.009	.071	.056	-.029	.019	-.060	.065	.010	-.088	1	
Age	-.138	.261**	.094	.050	-.018	-.110	.015	-.034	.207*	.070	-.165*	-.019	1

Appendix 14. The 8B's for Accessibility Framework

The 8B's	Description
Affordability	Affordability refers to both the financial and psychological cost of participating in an intervention or program. Financial costs include not only direct participation fees, but also hidden or indirect costs, such as transportation, childcare, or energy use (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019). Affordability applies both to the intervention itself and to the advice it provides. For example, a free intervention that primarily recommends expensive food products may still be practically inaccessible. Psychological costs relate to emotional or social barriers to participation, such as stigma, shame, or negative social norms.

Usability	Usability refers to how well the intervention fits the target group's needs and the realities of their daily lives. It considers whether the intervention responds to both explicitly expressed questions and unvoiced needs (which may remain unspoken due to shame, stigma, or lack of awareness). It also asks whether the target group is realistically able to implement the recommended changes within their material, social and temporal constraints (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019).
Trustworthiness	Trustworthiness covers three main aspects: (1) Trust and perceived safety of participating in an intervention: does it deliver on its promises? (2) Credibility of the messenger: trust is often shaped by previous experiences with certain actors (e.g. feeling stigmatized by a GP and therefore preferring a social worker). (3) Confidentiality and data protection: safeguarding sensitive information, both for facilitators and other participants (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019).
Empathy	Empathy means that the intervention starts from understanding the situation, experiences and perceptions of the target group. It requires a non-judgemental approach, avoiding guilt-inducing messages. Empathy should be reflected in: • The content of the intervention • The tools and methods used • Communication about and within the intervention • The facilitator's attitude and style (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019).

Comprehensibility	Comprehensibility concerns how easy it is for the target group to understand the intervention: its purpose, how to use it, when to use it and where to go for help.
	• Materials should match the language and health literacy levels of the participants.
	• Depending on the group, this may involve:
	  o The use of images, videos or other visual methods
	  o Replacing raw data with relatable testimonies or examples
	  o Translation of materials
	• Ideally, the target group is involved in developing materials, ensuring clarity and ease of use (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019).

Reachability/Accessibility	Accessibility in the narrow sense refers to minimizing physical, spatial and temporal barriers to participation. • This includes selecting: Appropriate periods to execute the intervention (e.g. avoiding holidays); Communication channels genuinely available to the target group; Locations that are easy to reach and feel safe • Venues can carry symbolic meanings; in-person interventions should take place in spaces where participants already feel comfortable and welcome (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019).
Availability	Availability concerns whether the offer is easily obtainable from the user's perspective. This can include: • Suitable times for activities • The absence of long waiting lists • Low administrative burden (simple registration)

	• Sufficient presence and attentiveness of facilitators (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019)
Publicity/ Awareness	An intervention must be known and recognizable to the target group for them to actually use it. This requires: • Effective communication channels and locations • Intermediaries who are well-positioned to reach people in socially vulnerable situations • Sustained and repeated communication, as people in vulnerable situations often face multiple stressors and need time to develop familiarity (Bouverne-De Bie, 2005; Vlaams Instituut Gezond Leven, 2019).

Appendix 15. Detailed Description of Workshop Participants in Belgium

Workshop with vulnerable citizens – Belgium
• Participants: The workshop in Belgium primarily involved adult women with a migration background and low socioeconomic status. In this specific session, most had a Turkish migration background, and one participant had a Belgian background with lived experience of poverty. In addition, she was neurodivergent and had a physical disability. Several participants also had training or work experience in food or health. • Digital skills: all participants use smartphones, multiple apps, and social media for recipe search; some are familiar with tools like ChatGPT. • Contents: description of workshop design and agenda; needs, barriers and facilitators regarding healthy and sustainable eating; feedback on the RecipeWatch concept; motivators and barriers for app adoption; key insights and recommendations; and a reflection on group dynamics.
Workshop with vulnerable citizens – Greece
• Participants: The workshop in Greece brought together low-income parents, caregivers, and educators who are connected to low-SES schools. Participants face daily challenges related to time scarcity, budget constraints, and the need to provide nutritious meals for their families while balancing work and caregiving responsibilities. • Digital skills: Participants are digitally literate and accustomed to using smartphones and the internet to search for recipes and meal ideas. Many rely on social media platforms and online recipe databases as part of their regular routine. • Contents: The session focused on exploring participants' motivations, barriers, and facilitators for adopting healthier and more sustainable eating habits at home. It included feedback on the RecipeWatch concept, discussion of preferred features (e.g., simplicity, cost-effectiveness), and reflections on how digital tools could realistically fit into busy family life.
Workshop with vulnerable citizens - Lithuania
• Participants: In Lithuania, the workshop involved older adults (primarily aged 55+), many of whom are highly educated, digitally engaged, and actively participate in community-based learning programs such as the University of the Third Age and Social Recipe initiatives. While not representative of all seniors, this group reflects a segment that is open to adopting new technologies for health improvement. • Digital skills: All participants own smartphones or tablets and use digital devices regularly for communication, information-seeking, and accessing educational content. They are comfortable navigating apps and online resources, though some may face age-related challenges such as reduced vision or fine motor control.

- Contents: The workshop explored participants' attitudes toward healthy and sustainable eating, their perceptions of the food industry, and their expectations from digital tools like RecipeWatch. Discussions emphasized the importance of scientific credibility, simple usability, and alignment with personal health goals, while also highlighting concerns about food quality and trust in commercial products.

Appendix 16. Guiding questions based on the 8B's

Dimension	Guiding analysis question(s)
Affordability	Does the report discuss financial or psychological costs related to the intervention or its recommendations? Are affordability concerns of participants captured?
Usability	Does the report address how well the intervention fits into participants' daily lives and routines? Are practical barriers or facilitators mentioned?
Trustworthiness	Does the report capture participants' trust in the tool, the messenger, or concerns about data privacy and credibility?
Empathy	Does the report reflect an understanding of participants' emotional and structural realities (e.g., stress, comfort food, stigma)? Is the tone of communication discussed?
Comprehensibility	Does the report mention participants' preferences for language, format, or clarity of information (e.g., visuals, short tips, simple explanations)?
Reachability	Does the report address physical, digital, or social access barriers (e.g., device ownership, internet access, safe locations)?
Availability	Does the report discuss how easily participants can access the intervention, support, or recommended ingredients?
Publicity	Does the report identify how participants would learn about the intervention or which trusted intermediaries could promote it?

Appendix 17. The results of the 8B-analysis for the workshop in Belgium

Application of the 8B's to the workshop in Belgium

This section presents the results of the 8B-analysis for the workshop in Belgium. To ensure a coherent evaluation, findings are structured by 'B'. Each subsection first describes the universal themes identified across the workshop, followed by specific insights that highlight unique cultural, structural, or demographic nuances.

Affordability

Key findings

- Participants express strong concern about the high price and low availability of healthy and gluten-free products.
- Healthy food is widely perceived as more expensive than unhealthy or convenient options.
- From the poverty expert's perspective:
  - Food serves primarily as comfort and safety for many low-income households.
  - There is a clear distinction between being "filled" (comfort, immediate satiety) and being "fed" (long-term health), which forms a core challenge for RecipeWatch.
- Participants call for budget-friendly recipes and filters in the app and for ingredients that are easy to find in regular supermarkets.

Assessment

- Strengths
  - Affordability is clearly recognized as a major concern.

- The idea of a "budget-friendly" filter and of recipes based on ingredients already at home aligns with financial constraints and may reduce waste.

- Gaps/risks
  - Affordability discussions focus largely on product price, with limited attention to:
    - potential costs related to data usage and storage when using the app
    - psychological costs, such as stigma or feeling "not good enough" when not following health advice.
  - Special products are recognized as expensive, but it remains unclear whether the app will primarily point users towards such products or systematically promote affordable basic alternatives.

Usability

Key findings

- Participants have strong cooking skills and existing routines, with a preference for:
  - Traditional cultural "comfort" dishes
  - Short, concise recipe videos.
- Health needs include:
  - lower-calorie desserts and sweets
  - less fat (e.g., oven-baked instead of fried)
  - recipes aligned with special rules and needs (e.g., gluten-free)
  - They prefer concrete, small changes (e.g., white flour → wholegrain flour) over radical recipe overhauls.
- People in poverty, according to the expert, often:
  - cook "by feel" rather than with exact measurements
  - rarely search for new recipes
  - may find detailed weighing and input burdensome.

Assessment

- Strengths
  - The concept of personalization (dietary restrictions, preferred cuisines) aligns well with expressed needs.
  - Functions such as "ingredient-based recipe suggestions" and emphasis on existing cooking skills show high potential fit with daily reality.
- Gaps/risks
  - Many apps are designed around structured, planned cooking with precise measurements, which may not match the "cooking by feel" habits in the context of poverty.
  - There is a risk that the app requires too many steps and too much user input, which could clash with high-stress situations and limited cognitive bandwidth.

Trustworthiness

Key Findings

- Participants are interested in health suggestions but insist on understanding why a suggestion is healthier.
- They ask for simple and clear explanations, not heavy scientific jargon.
- Repetition of core explanations is considered helpful, supporting learning over time.
- There is appreciation for professionals (dietitians and sociologists) co-facilitating the workshop, signaling that expert involvement can increase trust.
- The desired "tone" of the app is that of a "helpful expert-friend"; being credible but not moralizing.

Assessment

- Strengths

- The need for transparent, evidence-based but simple explanations is clearly recognized.
- Trust is linked to a combination of professional expertise and a friendly, non-patronizing style.

- Gaps/risks
  - Data protection and privacy are not explicitly discussed in the workshop summary.
  - Participants may be unsure what evidence the app's suggestions are based on, and how their data are used, stored, and protected.

Empathy

Key findings

- The report explicitly acknowledges:
  - the centrality of comfort food for people in low SES contexts
  - the role of chronic stress, trauma, and financial insecurity in limiting planning capacity and ability to perform complex tasks.
- The expert in poverty stresses the challenge of moving from "filling" to "feeding" without losing comfort.
- Participants appreciate a respectful workshop atmosphere and the combination of expert perspectives.

Assessment

- Strengths
  - The analysis itself is highly empathic, recognizing that structural conditions shape food choices.
  - There is sensitivity to the risk of moralizing and to the emotional dimensions of food.
- Gaps/risks
  - It remains to be clarified how this empathic understanding will be translated into the app's user interface, messaging and feedback.
  - If not carefully designed, health prompts could still be experienced as implicit criticism or pressure.

Comprehensibility

Key findings

- Participants prefer:
  - short videos (2–3 minutes)
  - short, concrete suggestions embedded directly in recipes.
- Long instructions, many steps and detailed text are considered burdensome.
- Voice input is highlighted as particularly important for people with high stress or low literacy.

Assessment

- Strengths
  - The report emphasizes brevity, clarity and visual content, which are key to comprehensibility.
  - Voice input is explicitly mentioned, acknowledging challenges with reading and typing.
- Gaps/risks
  - Language level and possible multilingual support (e.g., Turkish, Arabic) are not detailed.
  - There is no explicit mention of co-creating or testing wording with people with low literacy.

Accessibility/reachability

Key findings

- The workshop participants:
  - all use smartphones and multiple apps
  - are active on platforms like YouTube, Instagram and TikTok.
- The poverty expert suggests that adult literacy and education organizations could help introduce the app, provided it is simple enough.

Assessment

- Strengths

- The target group in this workshop already has strong digital accessibility; smartphones and apps are part of daily life.
- Trusted community settings (e.g., community center) are already being used as recruitment and interaction spaces.

- Gaps/risks
  - Other highly vulnerable groups (without stable internet, with outdated devices, older adults) are not represented in this specific workshop.
  - Physical and temporal barriers beyond digital access (e.g., home context, shared devices) are not extensively explored.

Availability

Key findings

- Participants mention:
  - storage limitations on their phones (many apps already installed); new apps must offer clear added value.
  - constraints regarding availability of ingredients. Some recommended products are expensive or hard to find.

Assessment

- Strengths
  - The report acknowledges that app installation and storage are not trivial and that recommendations must consider real availability of products in commonly used shops.
- Gaps/risks
  - Procedures for installing, setting up and updating the app, and potential technical support, are not elaborated.
  - It is unclear how often and how long the app must be used to provide meaningful benefits, which can affect perceived availability of support.

Awareness/Publicity

Key findings

- Participants are familiar with:
  - multiple recipe apps
  - digital influencers and platforms (YouTube, Instagram, TikTok).
- The idea of a (mini-)community within the app (sharing tips, comments) is positively received.

Assessment

- Strengths
  - The target group's current media habits offer clear entry points for promoting RecipeWatch.
  - The notion of peer feedback and community can support organic word-of-mouth awareness.
- Gaps/risks
  - There is no fully developed awareness strategy yet:
    - limited discussion of using trusted intermediaries (e.g., social workers, religious leaders) for promotion
    - no details on repeated, long-term communication, which is especially important for people under chronic stress.

Discussion on the Belgian workshop

The 8B analysis of the Belgian workshop highlights several cross-cutting themes, which will be highlighted below.

1. Comfort vs. health as a central tension

- Across Affordability, Usability and Empathy, the centrality of comfort food emerges. For vulnerable households, comfort and satiety are not "nice to have" but essential coping mechanisms.
- Interventions that ignore this may be perceived as culturally and emotionally tone-deaf, reducing both uptake and trust.

2. Structural constraints and cognitive bandwidth
   - Chronic stress, trauma and financial insecurity limit planning ability and available mental energy.
   - This has implications for app complexity, length of content, and required user input, touching Usability, Comprehensibility, and Availability.
3. Cultural and religious fit as a precondition, not an add-on
   - For many participants, certain restrictions and specific culinary traditions are non-negotiable.
   - Personalization and filtering must therefore be robust and built into the core of the tool (Usability, Trustworthiness).
4. Digital engagement vs. digital inequalities
   - While this group is digitally active, other vulnerable groups may not be.
   - Future work must be careful not to generalize from a digitally engaged subset, and consider how to reach and support those with limited digital access (Accessibility, Availability, Awareness).
5. Need for transparent, empathetic communication
   - Participants want understandable explanations of why changes are healthier, delivered in a friendly, non-judgmental way.
   - This underlines the importance of Trustworthiness, Empathy and Comprehensibility working together.

Appendix 18. The results of the 8B-analysis for the workshop in Greece

Application of the 8B's to the workshop in Greece
This section presents the results of the 8B-analysis for the workshop in Greece. To ensure a coherent evaluation, findings are structured by 'B'. Each subsection first describes the universal themes identified across the workshop, followed by specific insights that highlight unique cultural, structural, or demographic nuances.
Affordability
Key findings • Cost is mentioned as a main barrier to home cooking and to trying out new recipes. • Participants emphasize quick, easy, cost-efficient cooking, including batch cooking and reusing leftovers. • Ingredients that are rarely reused or hard to store (e.g., flax seeds, quinoa, avocado) are seen as poor investments and practical barriers. • Sustainability is better received when linked to cost efficacy and food waste reduction, not as an abstract environmental goal. Assessment • Strengths o The report clearly identifies cost and ingredient reusability as central concerns and links them directly to the acceptance of RecipeWatch suggestions.

- It shows that framing sustainability via cost savings and waste reduction is more acceptable to participants.

- Gaps/risks
  - There is limited detail on what level of cost is acceptable, and how participants balance price versus other factors (taste, convenience).
  - The analysis does not explore in depth how financial shocks or income variability might affect consistent use of the app and its recommendations.

Usability

Key findings

- Time and day-to-day practicality are key barriers; participants prefer quick and easy cooking.
- Recipes with many steps or many required materials are viewed as burdensome.
- Digital literacy is not a barrier; participants are used to searching for recipes online.
- Motivators for adoption include the app being free, practical, useful and functional; barriers include technical lags, advertisements, and "asking too much" from the user.
- A dynamic checklist is preferred over static settings, so that priorities (e.g., saving time vs saving money) can change depending on the situation (e.g., weekday vs weekend).

Assessment

- Strengths
  - The report captures very clearly that the tool must fit into a time-poor, high-stress daily reality and that usability is closely linked to perceived effort.
  - It highlights a concrete design direction: minimal input → immediate, actionable output and the importance of a dynamic prioritization feature.
- Gaps/risks
  - The workshop does not specify how much interaction (number of steps/time spent) is still acceptable before users disengage.
  - It remains unclear how well the app would perform for users with less stable devices (older phones, weaker connections) beyond the general mention of "technical lags".

Trustworthiness

Key Findings

- No explicit privacy or data protection concerns were raised, partly because the description of RecipeWatch did not emphasize personal data collection.
- Participants are interested in understanding the reasoning behind recommendations, especially when changes are unfamiliar.
- The app is seen as more acceptable if it acts like a supportive companion and offers some transparency about its evidence base.

Assessment

- Strengths
  - The report shows that explanatory feedback is central to trust: users want to know why a change is suggested.
  - Trust is not a major barrier at this stage; participants are open to an AI-driven companion if benefits are clear.

- Gaps/risks
    - Because data use and privacy were not foregrounded, the apparent lack of concern may underestimate future trust issues once a concrete app with logins, profiles and tracking is introduced.
    - There is no information on what participants would do when the app's advice conflicts with their own experience or preferences, which is critical for long-term trust.

Empathy

Key findings

- Empathy is only indirectly addressed: participants describe busy daily lives, constraints around cooking for their families, and the need not to be burdened with extra steps.
- Child-friendly, household-wide recipes are attractive, indicating that the app should align with family realities.
- Participants do not explicitly discuss feelings of shame, blame or judgement, but they do react negatively to tools that demand "too much" from them.

Assessment

- Strengths
    - The report recognizes that the app must acknowledge day-to-day constraints (time, effort, family meals) to be perceived as truly helpful.
- Gaps/risks
    - There is little explicit exploration of stigma, guilt or judgement around food choices, so the need for non-moralizing language is only implicit.
    - Without explicit user input on tone, there is a risk that health or sustainability messages may come across as lecturing rather than supportive.

Comprehensibility

Key findings

- Participants are digitally literate and use apps and the internet to look up recipes; basic comprehension of digital content is not a major concern.
- They express a wish to understand the reasoning for suggestions, implying a need for clear, simple explanations.
- There is no detailed information on reading levels, preferred language style, or the role of visuals.

Assessment

- Strengths
    - The report indicates that users are open to explanatory information as long as it is relevant and not overwhelming.
    - Digital skills provide a solid basis for using an app with moderate textual content.

- Gaps/risks
    - The absence of explicit discussion of reading level, language complexity or visual aids makes it difficult to tailor content precisely to comprehension needs.
    - It is unclear whether some users may still benefit from more visual or audio support, especially in more stressed or cognitively loaded situations.

Accessibility/Reachability

Key findings

- Participants have good digital access and are comfortable using apps and browsing online.
- The workshop does not report significant issues with device access or connectivity.
- However, participants note that technical lags and performance problems would be a barrier to continued use

Assessment

- Strengths
    - The report confirms that, for this group, a mobile app is a realistic channel and that reachability via smartphones is feasible.
- Gaps/risks
    - Accessibility for people with older devices, weaker internet connections, or disabilities is not addressed.
    - The role of contextual access points (e.g., using the app at work, on public Wi-Fi, or in shared devices) is not explored.

Availability

Key findings

- The workshop data provides very little information regarding Availability in the sense of access to services, programs or ongoing support.
- Availability is discussed implicitly only via ingredient availability and the desire for suggestions that are already available at home or easily found.

Assessment

- Strengths
    - The report recognizes that suggestions must be anchored in real-world availability of ingredients, which is essential for perceived feasibility.
- Gaps/risks
    - Availability as organizational and service access (how to access the app, support, or related services) is heavily insufficiently addressed.
    - Procedures for installing, setting up and updating the app, and the existence of any ongoing support or helpdesks, are not discussed.

Awareness/Publicity

Key findings

- The report does not describe how participants would hear about RecipeWatch or which channels they trust (e.g. schools, social media, health professionals).
- Recruitment for the workshop occurred via low-SES schools, but this pathway is not further analyzed as a potential dissemination route.

Assessment

- Strengths
  - The existing connection through schools indicates a potential dissemination network, even though this is not explicitly elaborated.
- Gaps/risks
  - Awareness/publicity is insufficiently addressed: there is no concrete information on communication channels, messaging, or trusted intermediaries.
  - Without this information, it is unclear how RecipeWatch could achieve initial uptake within similar Greek low-SES communities.

Discussion on the Greek workshop

1. Practicality as the ultimate filter

- Across all findings, participants consistently filter suggestions through a lens of day-to-day practicality: Does it save time? Does it save money? Will the recipe still taste good? Can I find the ingredients in my local shop?
- Health and sustainability are welcomed, but only when they do not compromise on these practical criteria. Interventions that ignore this hierarchy risk being perceived as disconnected from reality.

2. Taste and recipe success as a hard boundary

- A striking and consistent concern is whether suggested changes will make the recipe "work"; i.e. ‚maintain its sensory appeal and cooking success.
- This is not a minor preference but a deal-breaker: if participants fear that a healthier substitution will ruin the dish, they will not try it, regardless of health benefits.
- Design must treat taste preservation as a core constraint, not an afterthought.

3. The crowded digital landscape and app fatigue

- While participants are digitally literate and regularly search for recipes online, they are also selective about which apps to install due to phone storage limitations and the sheer number of existing tools.
- A new app must offer immediate, clear added value to justify the space and effort of installation and ongoing use.

4. Ingredient availability as a practical barrier

- Recommendations are only useful if the suggested ingredients are realistically available in commonly used shops and at an affordable price.
- Niche, expensive or hard-to-store ingredients (quinoa, flax seeds, avocado) are seen as barriers, not solutions.

5. Desire for transparent reasoning without burden

- Participants want to understand why a change is suggested (in terms of cost, time, health, or waste), but they do not want lengthy explanations.
- Communication must be concise, practical, and non-moralizing, respecting their time constraints.

Appendix 19. The results of the 8B-analysis for the workshop in Lithuania

Application of the 8B's to the workshop in Lithuania
This section presents the results of the 8B-analysis for the workshop in Lithuania. To ensure a coherent evaluation, findings are structured by 'B'. Each subsection first describes the universal themes identified across the workshop, followed by specific insights that highlight unique cultural, structural, or demographic nuances.
Affordability
Key findings Participants identify price as a barrier to eating healthily and sustainably, alongside a lack of knowledge. However, they also state that perceived healthiness and ingredient composition are more important than price or taste. The group likely has a higher-than-average income among seniors, which may shape their perceptions of affordability. Assessment • Strengths o The report acknowledges the role of price as a barrier but also notes the high health motivation of this group, offering a strong entry point for health-oriented advice. • Gaps/risks o Because participants are relatively well-off and highly educated, findings may underestimate affordability barriers for more vulnerable older adults. o There is little detail on specific price thresholds, substitutions, or tradeoffs that would be acceptable in lower-income senior populations.
Usability
Key findings • Participants respond positively to an app that suggests healthier alternatives. • They prefer short and concrete tips, e.g.: o reducing the amount of salt/sugar/fat, o changing the cooking method (oven instead of frying pan). • They are generally willing to accept less familiar replacements, especially if linked to clear health benefits. • Complex instructions and unhealthy suggestions in existing recipes are seen as barriers. • Participants favor step-by-step instructions as their primary source of help during app installation. Assessment • Strengths o The report identifies a clear preference for simple, actionable advice and provides a concrete design cue: brief tips embedded in recipes. o The explicit wish for step-by-step support offers guidance for onboarding and help flows. • Gaps/risks o The workshop does not clarify how much interaction or complexity is still acceptable before the tool is perceived as too demanding. o It is not fully explored how age-related factors (e.g., vision, dexterity, cognitive load) might affect ongoing usability beyond installation.

Trustworthiness

Key Findings

- Participants indicate general trust in the idea of the app's recommendations.
- They place strong emphasis on receiving brief, scientifically grounded explanations in an expert tone, rather than generic claims (e.g., "healthier", "better").
- They express no concern about privacy or sharing data for customization.

Assessment

- Strengths
  - The report clearly shows that an expert-based, evidence-informed style will be well received by this group.
  - The willingness to share data for personalization reduces a common barrier to implementing tailored features.
- Gaps/risks
  - The absence of privacy concerns in this group may not generalize to less educated or more privacy-sensitive seniors.
  - It remains unclear how trust would evolve if recommendations conflict with long-held beliefs (e.g. about chemicals or processed foods).

Empathy

Key findings

- Participants perceive the food industry as the main barrier to healthy eating and express a strong sense of distrust and powerlessness ("impossible to buy clean products").
- They see the impact of the food industry as outweighing individual food choices.
- Emotional aspects (fear, frustration) regarding food quality are present, but personal stigma or shame about their own choices is not extensively discussed.

Assessment

- Strengths
  - The report acknowledges the participants' structural perspective on barriers (industry, contamination), which is crucial to avoid over-individualizing responsibility.
- Gaps/risks
  - If the app focuses only on individual behavior change without acknowledging these systemic concerns, users may feel misunderstood or blamed.
  - There is little information on preferred tone (e.g., empathic, collaborative vs directive), which is important for communication design.

Comprehensibility

Key findings

- Participants prefer short, concrete tips and brief explanations, but they want these to be scientifically grounded.
- Complex recipe instructions are viewed as a barrier.
- All participants are highly educated and digitally literate, which suggests a relatively high baseline for comprehension.

Assessment

- Strengths
  - The report supports a design with concise but content-rich explanations, suitable for a literate audience that values expertise.
- Gaps/risks

- The comprehension needs of seniors with lower education or literacy are not represented, limiting generalizability.
- The potential role of visuals, audio, or larger fonts for age-related comprehension needs is not explored.

Accessibility/Reachability

Key findings

- Participants are digitally literate, own and use devices, and are socially active through municipal and educational programs.
- No direct barriers related to device ownership or basic digital access are reported.
- The group is already connected to health-promoting initiatives (Social Recipe, University of the Third Age).

Assessment

- Strengths
  - The report demonstrates that this subgroup of seniors can be effectively reached through digital tools and existing community structures.
- Gaps/risks
  - The situation of more isolated, less digitally skilled, or lower-income seniors is not captured.
  - There is no discussion of physical or cognitive accessibility issues (e.g., vision, fine motor skills) that may affect reach and use.

Availability

Key findings

- Availability in the sense of services, programs, or support structures is barely mentioned.
- Discussions focus primarily on food availability and perceived contamination, not on how to access supportive health tools or services.
- There is no description of pathways to obtain or maintain access to RecipeWatch.

Assessment

- Strengths
  - The report indirectly points to a form of availability concern related to trustworthy food sources, although this goes beyond the app itself.
- Gaps/risks
  - Availability as defined in the 8B framework (access to an offer, organizational access, administrative hurdles) is heavily insufficiently addressed.
  - There is no information on how seniors would get and keep access to the app (e.g., distribution, updates, support if something goes wrong).

Awareness/Publicity

Key findings

- The report does not address how participants would learn about RecipeWatch.
- There is no discussion of trusted messengers (e.g., doctors, program facilitators, peers) or communication channels for seniors.

Assessment

- Strengths
  - The workshop context (Social Recipe, University of the Third Age) implicitly suggests institutional channels that could be used for dissemination.
- Gaps/risks

- Awareness/publicity is insufficiently addressed; there is no explicit data on how to effectively introduce and promote the app among older adults.
- Without this information, planning a scalable rollout strategy for Lithuanian seniors is difficult.

Discussion on the Lithuanian workshop

1. Health as a primary motivator, but shadowed by systemic distrust

- Unlike other groups, Lithuanian participants explicitly prioritize health benefits over price or taste and are willing to try less familiar substitutions if convinced of their health impact.
- However, this health motivation is tempered by a deep distrust of the food industry and a pervasive belief that "clean" or "chemical-free" products are increasingly unavailable.
- Interventions that focus solely on individual dietary choices may feel out of touch if they do not acknowledge these structural frustrations with the food system.

2. Expert guidance and scientific credibility as trust anchors

- Participants consistently request brief, scientifically grounded explanations in an expert tone, rather than generic claims that something is "healthier" or "better".
- This preference reflects their higher education and digital literacy and suggests that credibility and evidence are central to acceptance.
- Vague or oversimplified messaging risks being perceived as patronizing or unconvincing.

3. Simplicity of tips vs. complexity of recipes

- While participants enjoy cooking and are familiar with recipes, they identify complex instructions and unhealthy suggestions in recipes as barriers.
- In contrast, short, concrete, actionable tips (reduce salt/sugar/fat, change cooking method) are positively received.
- The app should avoid replicating recipe complexity; instead, it should deliver simple, embedded guidance with clear step-by-step support.

4. Digital literacy as a privilege, not a universal baseline

- The Lithuanian group is highly educated, digitally literate, and socially active through municipal programs (Social Recipe, University of the Third Age).
- This profile is not representative of all older adults; many seniors are more isolated, less digitally skilled or lower-income.
- Findings from this group should not be generalized to the broader senior population without explicit research on less visible, less connected older adults.

5. The role of community and institutional pathways

- Participants are already embedded in trusted institutional structures (municipal health programs, educational initiatives).
- These existing networks represent both a strength (a channel for dissemination and support) and a limitation (the workshop captures only those already engaged in such programs).

Appendix 20. Limitations of the current findings

Limitations of the current findings
The insights are derived from workshops conducted with highly specific and small target groups in each country. These groups differ markedly in demographic, cultural, and socioeconomic characteristics: • Belgium had only female participants with migration backgrounds and low socioeconomic status. • Greece engaged low-income parents, caregivers, and educators linked to low-SES schools. • Lithuania involved older adults with higher education, digital literacy, and active social participation. Each pilot reflects a unique local context and recruitment approach, which shapes the findings and their applicability. As a result, these findings provide an in-depth qualitative understanding but are not generalizable to all vulnerable populations within or across the countries. This hyper specificity highlights the necessity to exercise caution in extrapolating findings to wider and more diverse groups.

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