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Personal values, motives, and healthy and sustainable food choices: Examining differences between home meals and restaurant meals

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ABSTRACT

People are increasingly eating out in restaurants, where meals tend to be higher in calories, less nutritious, and contain more meat. In this paper, we argue that differences in the motivational processes underlying people's food choices could help to explain why food choices made in restaurants are typically unhealthier and less sustainable than at home. Using online survey data from 301 Dutch participants, we compared the influence of stable personal values and transient food choice motives on the healthiness and sustainability of meals chosen in a hypothetical choice task, which was geared to the home and restaurant consumption contexts. As expected, participants opted for unhealthy and meat-based meals more often in the restaurant than the home context. Conservation values related negatively and self-transcendence values positively to choosing sustainable meals both in the home and in the restaurant context, although the relation with self-transcendence values was significantly weaker in the restaurant context. Also, taste and social eating were considered more important for choosing restaurant meals, while health was a more important motive for food choices at home. Finally, model comparisons revealed that motives were better predictors of healthy meal choices in both contexts, while the influence of values and motives on sustainable meal choices was more similar. In conclusion, the results from the present study enhance our understanding of differences between choosing home and restaurant meals by providing an account of the values and motives associated with the healthiness and sustainability of home and restaurant meal choices.

1. Introduction

Over the past decades, eating out in restaurants has become a popular leisure activity. Taking the Netherlands as an example, the restaurant industry's economic interest increased by 60% between 2010 and 2020, making it the fastest-growing sector in the economy (Koninklijke Horeca Nederland, 2019). Similar trends have been documented in other European countries and the US (ERS, 2022; Orfanos et al., 2009). This collective shift in eating practices raises concerns about the quality of consumers' diets: eating out has been associated with higher calorie intake as well as consuming fewer vegetables and more meat (Lachat et al., 2012; Mancino et al., 2009; Todd et al., 2010), which means that eating at a restaurant is typically less healthy and less sustainable than eating at home. Moreover, a literature review by Bezerra and colleagues (2012) in which 20 cross-sectional studies and 8 prospective cohort studies were assessed, revealed a positive association between eating out and body weight in about half of these studies. Actively motivating consumers to opt for healthier and/or plant-based meals in restaurants, could help prevent the shift to eating out at restaurants more often from having negative long-term consequences for consumers' health and the environment. However, given the accumulating evidence that food choices are made differently in restaurants than at home (Bauer et al., 2022; Biermann & Rau, 2020; Feather et al., 1998), there is an urgent need for a better understanding of the disparities between these two eating contexts. In this study, we propose that there may be important differences between choosing meals at home and at a restaurant in terms of the motivational processes that guide people's food choices. More specifically, we aim to provide a psychological perspective on the personal values and motives associated with healthy and sustainable home and restaurant food choices, by examining hypothetical home and restaurant[1] meal choices in an online survey experiment. It is hoped that this research will contribute to a deeper understanding of context-specific meal selection and thereby benefit the development of new strategies for encouraging healthy and sustainable food choices in

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[1] The label 'restaurants' in the present study covers dine-in eating facilities from various price categories and types, including cafeterias, pizzerias, fine dining, etc.

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restaurants.

Fathoming food choices is challenging due to the many individual and situational factors that influence them, including socio-demographic factors, personal motivations and preferences, habits, social norms, consumption context, and cultural context (Higgs, 2015; Köster, 2009; Prinsen et al., 2013; Rozin, 2005; Sobal et al., 2014; Stok et al., 2017). Automated processes such as habits are typically considered the most accurate predictors of food choices, but their reliance on repetitive behaviors in a specific context also renders them less suitable for examining occasional and changing contexts (Wood et al., 2005). When seeking to better understand restaurant meal choices, focusing on stable intrapersonal factors such as personal values may therefore offer a more appropriate approach. Personal values are general standards of behavior relating to what one finds important in life and have been frequently highlighted as a major factor guiding consumption behaviors in consumer research (Bardi & Schwartz, 2003; Krystallis et al., 2012; Schwartz, 1992; Steg et al., 2014; Vinson et al., 1977). Schwartz's theory of basic values (1992, 2012), one of the most well-known and widely used value frameworks in psychology literature, organizes values on two bipolar dimensions based on their underlying motivational goal. The first-dimension contrasts *self-enhancement* values, emphasizing concern for personal growth and success, with *self-transcendence* values, emphasizing concern for the welfare and interest of others, nature, and the environment. The second dimension opposes *openness to change* and *conservation*, capturing the conflict between values that emphasize independence of thought, action, and feelings and readiness for change, and values that emphasize preservation, stability, and resistance to change. People usually have a few central values that they consider more important than others, and they tend to lean towards one side of each higher-order value dimension (Schwartz, 1992, 2012; Schwartz & Boehnke, 2004).

Understanding what consumers value can help explain why different products appeal to different consumers. In this matter, it is important to distinguish between the personal values dealt with in this study, and the value derived from consumption. Typically, people tend to favor foods or products that are congruent with values that are important to them (Homer & Kahle, 1988). Even when not consciously thinking about their values, they may base their choices on whether consumption is likely to bring them closer to an end-state they desire. Whether they are satisfied with their choice afterward, is in turn determined by how well their consumption experience aligns with the personal values they hold (Huber et al., 2001; Oliver, 1996). Hence, it should be clear that values as enduring beliefs about preferable or desirable end-states and value derived from the consumption of foods or products are inevitably interrelated, but nevertheless distinct.

One particularly strong and consistent association that has been observed, is that of self-transcendence values with sustainable choices, such as household energy use (Abrahamse & Steg, 2011; Steg, 2008), ethical fashion shopping (Manchiraju & Sadachar, 2014), and buying fair trade products (Doran, 2009). More importantly, significant links between values and sustainable food choices have consistently been found as well (e.g., Homer & Kahle, 1988; Honkanen et al., 2006). For instance, people who endorse strong self-transcendence values are more likely to maintain a vegetarian diet (Allen et al., 2000; Worsley & Lea, 2008) and buy organic food products (Grunert & Juhl, 1995; Thøgersen & Olander, 2002). Although the importance of values for understanding sustainable food choices has been well established, their importance with regard to healthy consumer choices remains more inconclusive. Previous research has suggested that strong conservation values could manifest in health-related attitudes and behaviors, such as weight control, a higher interest in healthy eating, avoiding foods or beverages that are bad for one's health, and adhering to dietary guidelines (Aertsens et al., 2009; Lee et al., 2014; Lindeman & Sirelius, 2001). This is often attributed to conservation-oriented consumers being more concerned about complying with norms and guidelines and avoiding actions that could potentially harm their personal or social well-being, for instance because they are perceived as unhealthy (Higgins, 1997; Werth & Foerster, 2007). Furthermore, conservation values have occasionally been linked to healthier dietary choices (Hansen et al., 2017; Hansen & Uth Thomsen, 2018), and some researchers have linked self-transcendence values to making healthier food choices (Hansen & Uth Thomsen, 2018; Nijmeijer et al., 2004), like eating more fruit and vegetables (Allen et al., 2000; Farragher et al., 2015). Although the relations between personal values and healthy food choices typically reported in the literature tend to be weaker and less consistent than is the case for sustainable food choices, there is sufficient evidence to conclude that personal values are a relevant predictor of food choices in both domains.

Due to their stable and abstract nature, values can be useful to predict a variety of behaviors across time and situations, including food choices. However, whether and how personal values are expressed in behavior is also affected by external factors, such as the context in which food is consumed (Larson & Story, 2009; Mikkelsen, 2011; Story et al., 2008). Steg et al. (2014) have suggested that people can wish to prioritize their choices differently due to situational factors and expectations, typically resulting in prioritizing personal gains or pleasure over social or environmental interests. One study observed that 59% of flexitarians (i.e., people who limit their meat intake but still include meat in their diets; Dagevos, 2014), chose to eat meat more frequently in restaurants than at home (Biermann & Rau, 2020). The main reason for this choice according to participants was that they wanted to treat themselves to something special, suggesting that they occasionally prioritize personal pleasure by eating meat even when this choice would violate their universalism-oriented values. Alternatively, different values and corresponding behaviors may be activated or emphasized by the presence of external cues in out-of-home food environments, such as food advertisements or indications of social eating standards (Bardi & Schwartz, 2003; Prinsen et al., 2013; Wansink, 2004). Altogether, these findings show that people may have different preferences and are more susceptible to external influences when eating out. This raises important questions about the stability of value-choice relations across contexts, suggesting that people's values may express differently in their choices for home compared to restaurant meals.

Several theories suggest that personal values lie at the broadest level of the cognitive belief system that guides an individual's behavior from within, while motives operate on a more specific level (Rokeach, 1973; Vinson et al., 1977; Honkanen et al., 2006). Values and motives could thus both be identified as internal guiders of behavior, only operating on different levels: values are abstract, stable and applicable to various life domains, whereas motives are specific, transient and applicable to one single domain. Food choice motives, sometimes referred to as food values in the literature (Lusk & Briggeman, 2009), are choice reasons that are directed towards specific food attributes or anticipated consequences from eating it (De Boer et al., 2007; Rokeach, 1973; Vinson et al., 1977). Such motives could, for example, relate to a meal's price, sensory quality (e.g., a favorable taste, texture, smell), healthiness, or environmental impact (Lindeman & Väänänen, 2000; Steptoe et al., 1995).

Although food choice motives can partially derive from values, they are also determined by the context an individual is in. Some interesting differences were found in a recent study, in which participants were asked to indicate their primary concerns about meals consumed at home and at a restaurant (Biermann & Rau, 2020). In this study, meal tastiness was ranked most important in both settings, although notably higher when dining out (74%) than at home (36%). For home meals, 36% of participants ranked healthiness as the most important factor and 10% ranked environmental friendliness most highly. However, for restaurant meals, both food healthiness (9%) and environmental friendliness (3%) were of less importance. Instead, eating aspects such as enjoyment, social interaction, and treating oneself were more valued by participants when in a restaurant. Similar results were obtained in a focus-group study, in which participants indicated that they viewed going out for

dinner as a special occasion where healthy food is not an immediate concern (Allman-Farinelli et al., 2019). Taken together, these studies illustrate the volatile nature of food choice motives, supporting the notion that food choice motives are prioritized differently when at home compared to at a restaurant.

1.1. The present research

The present study aimed to examine differences in how healthy and sustainable food choices are made when selecting restaurant meals compared to home meals. More specifically, we investigated the extent to which personal values and food choice motives can explain whether people choose healthy and/or sustainable meals in an online menu choice task, using semantical framing to manipulate decision-making in the home and restaurant consumption contexts. We first hypothesized that healthier and more sustainable food choices are made in the home context, compared to the restaurant context. Second, we hypothesized that values – according to their stable nature – influence food choices both in the home and restaurant context. However, following the evidence regarding fluctuations in value-behavior relations across contexts, we expected to observe stronger value-choice relations for the healthiness and sustainability of meals chosen at home. Third, we hypothesized that motives are more context-dependent, meaning that the importance and ranking of meal tastiness, healthiness, sustainability, price, and socialness are different for the home and restaurant context, with different motives being significantly related to food choices. Fourth, we hypothesized that motives have a larger influence on food choices than values, especially when choosing restaurant meals as compared with home meals.

2. Methods

2.1. Participants and design

Data of 301 Dutch participants were collected through an online survey in December 2021. Respondents' ages ranged from 18 to 90 years old ($M = 51.4$, $SD = 17.8$), and 49.2% of respondents identified as female. Low-educated people represented 27.6% of the sample, middle-educated 41.9%, and high-educated 30.6%. The average Body Mass Index (BMI) score was 25.5 ($SD = 4.9$), with a range of 17.0–44.1. Grouping BMI scores revealed that 1% of respondents were underweight, 45.5% had a healthy weight, 30.9% were overweight, and 12.6% were categorized as obese. The remaining 10% of respondents chose not to provide information about their weight or height.

2.2. Data collection and procedure

A panel agency (Flycatcher.eu) recruited participants from their research panel, which was ISO-certified for market, opinion, and social research (ISO 20252; Flycatcher, 2022). Anyone 18 and older with their own e-mail address can sign up for the panel. Membership is voluntary, and registration occurs only after explicit consent has been given. Respondents were compensated with points that could be exchanged for gift cards, as well as a ticket for the company's quarterly lottery. The study was approved by Utrecht University's Social and Behavioural Science faculty's Ethical Review Board.

A total of $n = 494$ panel members were invited to participate in the survey via email, of which $n = 327$ (66%) responded. Upon starting the questionnaire, respondents were asked how many days a week they ate meat with their lunch and/or dinner in an average week. Respondents who declared that they ate meat at least one day per week were allowed to proceed with the survey, while those who adhered to a vegetarian diet (0 days; $n = 26$) were excluded from further participation. Participants were then presented with the personal value questionnaire, after which they were randomly assigned to either the home meal or restaurant meal condition. Next, food choice motives and hypothetical meal choices were administered, followed by several control variables.

2.3. Measurements

2.3.1. Main variables

2.3.1.1. Personal values. The 10-item Short Schwartz Value Survey (SSVS; Lindeman & Verkasalo, 2010) was used to assess participants' values. The scale offers single-item assessments for each of the 10 human values identified by Schwartz (1992): power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. Lindeman and Verkasalo (2010) validated the SSVS as a reliable alternative for the original 57-item Schwartz Value Survey (Schwartz, 1992). Responses are rated on a 9-point Likert-scale (0 = *opposed to my values*, 1 = *not important*, 4 = *important*, 8 = *of supreme importance*). Scores for four higher-order value types were calculated by averaging the values representing each type (Schwartz & Boehnke, 2004): self-transcendence (universalism, benevolence), self-enhancement (power, achievement), openness to change (stimulation, self-direction), and conservation (tradition, security, and conformity). Cronbach's alphas ranged from 0.60 to 0.79, indicating acceptable to good internal consistencies for the higher-order values.

2.3.1.2. Food choice motives. For surveying food choice motives, we created an adjusted version of the Food Choice Questionnaire (Steptoe et al., 1995) and the Reasons to Snack Inventory (Verhoeven et al., 2015). The questionnaire was designed in such a way that the individual subscales and items would be relevant to both consumption contexts but was – depending on the condition participants were assigned to – either supplied with the prefix "When I eat at home …", or "When I go out for dinner …".[2] Example items are "… I don't pay attention to whether the meal is healthy" (reversed; health motives) and "… I pay attention to whether the meal is locally produced" (sustainable motives). Five motives were identified using factor analysis, resulting in a 13-item scale: health motives (3 items; $\alpha = 0.74$), sensory motives (3 items; $\alpha = 0.55$), sustainability motives (3 items; $\alpha = 0.63$), price motives (2 items; $\alpha = 0.64$), and social motives (2 items; $\alpha = 0.80$). Internal consistency was acceptable for all subscales except for sensory motives. Responses were rated on a 7-point Likert scale, ranging from *absolutely not true* (1) to *absolutely true* (7). A full overview of the factor analysis results, and final scale items are enclosed in Appendix A and B.

2.3.1.3. Meal choice. A hypothetical menu choice task was designed to assess the healthiness and sustainability of home and restaurant meal choices. Participants were either informed that the task was about home meal choices and instructed to put together a weekly menu of meals that they would like to eat for dinner, or informed that they would go out to eat at their favorite restaurants this week and instructed to choose a dish they wanted to eat from each restaurant's menu. Both conditions received similar information that their task was to choose each time which dish they would choose. Participants were presented with five different menu cards, each featuring four meal options: one healthy and sustainable meal (e.g., veggie burger patty and side salad), one healthy and unsustainable meal (e.g., burger patty and side salad), one unhealthy and sustainable meal (e.g., veggie hamburger with fries), and one unhealthy and unsustainable meal (e.g., hamburger with fries). A sustainable choice score was calculated by counting the number of times a sustainable meal was chosen (scores ranging from 0 to 5), and a healthy choice score was calculated likewise based on the number of healthy meals chosen.

[2] For clarification, this item-prefix was appended with the following informative statement in the survey: "By going out for dinner, we mean eating out in a restaurant, eatery, or brasserie."

Each menu card contained meals that would be likely to appear on the menu in Dutch restaurants or prepared as home-cooked meals. Objective criteria for constituting (un)healthy and (un)sustainable meal options were derived from consensus on unhealthy meals being low in fiber and high in fat and salt, and unsustainable meals being high in meat. To check whether meals accurately represented (un)healthy or (un)sustainable meal types, seven experts in the domain of psychology of eating assessed how meals would be perceived from a consumer perspective, with a focus on health and sustainability. Healthy and sustainable options were marked with informative icons. We opted for neutral, informative labels because this type of labeling appeared to have a marginal influence on food choices in prior research (Cadario & Chandon, 2020). An overview of the menu choice task trials is enclosed in Appendix C.

2.3.2. Control variables

Several control variables were included for exploratory purposes and to control for unintended differences between groups. Two items administered how important participants considered it to eat healthily, as well as to eat sustainably, rated on a 5-point Likert scale (1 = *very unimportant*; 5 = *very important*). In addition, a 2-item measurement for the assessment of explicit "unhealthy = tasty" beliefs was adapted from Werle and colleagues (2013; α = 0.76). These items were adjusted to additionally measure "meat = tasty" beliefs ("Meatless meals rarely taste good"; "There is no way to eat meatless without sacrificing taste"; α = 0.84). Responses were rated on a 7-point Likert scale (1 = *totally disagree*; 7 = *totally agree*), and scores were calculated by averaging the scores from both items. Lastly, participants were also asked to rate on a scale from 0 to 100 how hungry they were at the start of this survey.

2.3.3. Socio-demographic variables

Participants' age, gender and educational level were assessed. Based on the classification of the Dutch educational system, three levels were defined: high (university, college, higher vocational, general secondary, and intermediate vocational education), middle (general intermediate and lower vocational education), and low (elementary education or less). Additionally, BMI was assessed because participants who are overweight or obese may show a greater tendency towards selecting energy-dense foods on the menu choice task (Mela, 2001). BMI was computed from reported weight and height (kg/m^2), used to determine participants' weight status: underweight (<18.5), healthy weight (≥18.5 and < 25), overweight (≥25 and < 30), and obesity (≥30).

2.4. Analytical procedures

The data was analyzed in RStudio 4.1.1 (RStudioTeam, 2022). Key construct means, standard deviations and Pearson inter-correlations were calculated separately for the home and restaurant meal conditions. Two independent-sample t-tests were conducted to test hypothesis 1, comparing means for healthy and sustainable meal choices between conditions. To test hypotheses 2, 3, and 4, a multigroup path analysis with manifest variables was performed using the lavaan package (Rosseel, 2012). The saturated multigroup model including all values and motives as predictors of meal choices was first fitted to the data, after which paths with a nonsignificant Wald *Z*-statistic were deleted one by one (Peugh & Enders, 2010). This method of overfitting and then deleting nonsignificant parameters was proposed by MacCallum (1986) as the best way to determine the true path model. To test for differences between conditions, the unconstrained model was compared to a model in which all parameter estimates were constrained to be equal across groups, by evaluating changes in model fit indices. The covariance matrix was used as input, and path models were fitted using maximum likelihood with robust standard errors, accounting for heteroskedasticity and non-normality. Model fit was assessed via traditional χ^2, which should be nonsignificant for acceptable models. Four additional model-fit indicators are reported: standardized root mean squared residual (SRMR), root mean square error of approximation (RMSEA), goodness of fit index (GFI), and comparative fit index (CFI). Cut-off scores for acceptable models are SRMR <0.10, RMSEA <0.08, and GFI and CFI greater than 0.90 (Browne & Cudeck, 1992).

3. Results

3.1. Descriptive statistics

Means and standard deviations of key constructs are displayed in Table 1 and Pearson correlations between key constructs are presented in Table 2. Randomization checks revealed no significant differences between the home and restaurant meal conditions for any of the four higher-order value types: self-transcendence (p = .077), self-enhancement (p = .377), openness to change (p = .431), and conservation (p = .224), although a non-significant trend was observed for self-transcendence. Similarly, no differences between conditions were observed for any of the socio-demographic variables: age (p = .925), gender, (p = .390), educational level, (p = .491), BMI (p = .329). Furthermore, participants in both groups reported being equally hungry at the start of the experiment (p = .493) and were similar in their frequency of meat consumption (p = .888), perceived importance of healthy eating (p = .124) and sustainable eating (p = .564), as well as their explicit "unhealthy = tasty" (p = .334) and "meat = tasty" (p = .807) beliefs. Additional analyses revealed that eating healthily was overall considered more important than eating sustainably (p < .001), and explicit "meat = tasty" beliefs were stronger than explicit "unhealthy = tasty" beliefs (p < .001).

3.2. Healthy and sustainable meal choices

To test whether unhealthier and less sustainable meal choices were made by participants in the restaurant meal condition as compared to the home meal condition, two independent samples t-tests were performed. As expected, participants in the at-home condition made healthier meal choices on the menu choice task, t (283.67) = 6.56, p <

Table 1
Means and standard deviations of key constructs and control variables.

	Home		Restaurant		Total sample	
	M	*SD*	*M*	*SD*	*M*	*SD*
			Key constructs			
Self-transcendence	5.61	1.36	5.88	1.34	5.74	1.36
Self-enhancement	3.13	1.39	2.99	1.37	3.06	1.38
Openness to change	4.74	1.28	4.86	1.35	4.80	1.31
Conservation	5.08	1.41	5.28	1.32	5.18	1.37
Health motives	5.26	1.02	4.14	1.21	4.71	1.25
Sensory motives	5.05	0.92	5.50	0.82	5.27	0.90
Sustainable motives	3.63	1.15	3.27	1.16	3.45	1.17
Price motives	4.35	1.12	3.78	1.24	4.07	1.21
Social motives	4.65	1.11	5.36	1.11	5.00	1.16
Healthy meal choice	3.60	1.21	2.58	1.48	3.10	1.44
Sustainable meal choice	1.08	1.46	0.97	1.35	1.03	1.40
			Control variables			
Hunger	26.3	23.8	24.4	23.3	25.4	23.5
Meat consumption	5.97	1.69	5.99	1.50	5.98	1.60
Healthy eating importance	3.99	0.69	3.86	0.75	3.93	0.73
Sustainable eating importance	2.97	0.93	3.03	0.87	3.00	0.90
"Unhealthy = tasty" beliefs	1.89	0.82	1.99	0.98	1.94	0.91
"Meat = tasty" beliefs	2.37	1.08	2.34	1.15	2.36	1.11

Note. N = 301 (home meal condition n = 148; restaurant meal condition n = 153).

Table 2
Pearson correlations between key constructs. The upper half of the matrix displays the correlations for the home meal condition, the bottom half for the restaurant meal condition.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Self-transcendence		−.14	.36***	.53***	.30***	.33***	.23**	.13	.21**	.14	.27***
2. Self-enhancement	−.07		.39***	.04	−.14	−.12	−.08	−.13	−.18*	−.06	−.05
3. Openness to change	.33***	.30***		.31***	.11	.01	.12	−.08	−.07	−.05	.05
4. Conservation	.32***	.07	.04		.11	.28***	.02	.21**	.20*	.09	−.11
5. Health motives	.26**	.04	.02	.09		.13	.46***	.16	.27***	.42***	.28***
6. Sensory motives	.07	.04	.02	.18*	−.07		.20*	.11	.36***	.07	−.02
7. Sustainable motives	.15	.07	.15	.09	.46***	−.03		−.03	.31***	.20*	.33***
8. Price motives	.08	.14	.01	.09	.10	.06	−.05		−.01	.03	−.07
9. Social motives	.26**	−.11	.08	.17*	.15	.42***	.07	−.12		.08	.06
10. Healthy meal choices	.13	−.05	.06	−.07	.45***	.05	.27**	−.08	.19*		.09
11. Sustainable meal choices	.14	.06	.07	−.21*	.27**	.01	.26**	−.01	−.05	.05	

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

.001, $d = 0.76$.[3] Healthy meals were selected in 72% of home meal choices, as compared to only 51% of restaurant meal choices. No significant difference was observed for sustainable meal choices, $t(299) = 0.69$, $p = .490$, $d = 0.08$, implying that participants opted for sustainable meals just as often in the restaurant context (19.4% sustainable) as in the home context (21.6% sustainable). These results partly confirm our first hypothesis, showing that meals chosen for eating out are unhealthier than for eating at home, while no difference between consumption contexts was observed for sustainable food choices.

3.3. The influence of values and motives on context-specific meal choices

Having determined that home meal choices are different from meal choices in restaurants in terms of healthiness, but not sustainability, we will now move on to examine whether this choice behavior could be explained by values and motives, using multigroup path-analysis. A saturated model including all four values, five motives, and two meal choice variables was first fitted to data, rendering perfect model fit indices due to overfitting. We then specified the model by evaluating the statistical relevance of individual paths in the home and restaurant conditions separately. Parameters with non-significant ($p < .05$) Wald Z-statistics were univariately deleted from the model until none were left. The reduced model retained conservation values and health motives as predictors of healthy meal choices, and conservation values, health motives, and sustainable motives as predictors of sustainable meal choices. The model provided an excellent fit to the data, as can be seen in Table 3, and was therefore retained as the non-nested model for further analyses. Table 4 presents an overview of the path coefficients in the non-nested model.

3.3.1. The role of personal values

To test our second hypothesis, stating that values influence food choices in both settings but with stronger value-choice relations for home meals, a nested multigroup model estimating only paths from values to meal choices was evaluated. The unconstrained values model yielded a significant chi-square and fit indices beyond acceptable limits (Table 3), indicating a poor fit of model to data. The variances explained by values were respectively 0.7% (home) and 0.5% (restaurant) for healthy meal choices, and 16.4% (home) and 9.2% (restaurant) for sustainable meal choices. Constraining parameters to be equal across conditions resulted in a significant decrease in model fit, $\Delta\chi^2 = 46.78$ ($\Delta df = 5$), $p < .001$, indicating that some paths differed between the two conditions.

Conservation values appeared non-significant as a predictor for selecting healthy meals in both contexts. Constraining the remaining paths one by one revealed that conservation values predicted sustainable home and restaurant meal choices both equally non-significant, $\Delta\chi^2 = 0.39$ ($\Delta df = 1$), $p = .530$, whereas the path from self-transcendence values to sustainable meal choices did differ between contexts, $\Delta\chi^2 = 3.90$ ($\Delta df = 1$), $p = .048$. Self-transcendence values were significantly positively related to selecting plant-based meals in both contexts, but this relation was stronger for home meal choices. Showing stable as well as varying value-choice relations, these results thereby partly confirm our second hypothesis. Participants who highly valued

Table 3
Model fit indices for the non-nested and nested models.

Model	χ^2	*df*	*p*	*SRMR*	*RMSEA*	*CFI*	*GFI*
Values & motives *(non-nested)*	1.58	4	.813	0.01	0.00	1.00	1.00
Home	0.04	2	.982	0.00	0.00	1.00	1.00
Restaurant	1.54	2	.463	0.02	0.00	1.00	0.99
Values only *(nested)*	95.80	10	<.001	0.12	0.24	0.30	0.96
Home	41.28	5	<.001	0.12	0.22	0.42	0.81
Restaurant	54.52	5	<.001	0.14	0.26	0.18	0.76
Motives only *(nested)*	39.82	10	<.001	0.05	0.14	0.76	0.99
Home	19.96	5	.001	0.05	0.14	0.76	0.90
Restaurant	19.86	5	.001	0.06	0.14	0.76	0.90

Note. *SRMR* = Standardized Root Mean Square Residuals; *RMSEA* = Root Mean Square Error of Approximation; *CFI* = Comparative Fit Index; *GFI* = Goodness of Fit Index. The non-nested model represents the model after removing non-significant paths (see section 4.3). The values only and motives only models are nested in the non-nested model and created by setting all path estimates of motives (in the values-only model) or values (in the motives-only model) to 0.

Table 4
Path estimates for the home condition, the restaurant condition, and the total sample.

	Home		Restaurant		Total sample	
	β	*p-value*	*β*	*p-value*	*β*	*p-value*
Healthy meal choices						
Conservation	0.03	.562	−0.13	.129	−0.06	.257
Health motives	0.49	<.001	0.57	<.001	0.61	<.001
Sustainable meal choices						
Self-transcendence	0.39	<.001	0.18	.012	0.29	<.001
Conservation	−0.33	<.001	−0.30	<.001	−0.30	<.001
Health motives	0.16	.116	0.17	.062	0.14	.022
Sustainable motives	0.25	.014	0.23	.036	0.25	.001

Note. β represents standardized path coefficients. The path coefficients and *p*-values in this table were derived from the non-nested multigroup model.

[3] A Welch's *t*-test was performed for healthy meal choices because the assumption of equal variances was violated, as indicated by a significant Levene's test ($p = .001$).

conservation made less sustainable meal choices, but the strength of this relation was stable across consumption contexts. In contrast, strong self-transcendence values were a stronger indicator of value-congruent (i.e., sustainable) choices if food choices were made at home, although a significant relation with the sustainability of restaurant meal choices was observed as well.

3.3.2. The role of food choice motives

A second, nested model including only path estimations between motives and meal choices was evaluated to test the hypothesis that motives are context-dependent and different motives predict home and restaurant food choices. Health motives were included as a predictor of healthy meal choices, and health as well as sustainable motives as predictors of sustainable meal choices. The chi-square of the unconstrained model was significant and fit indices were beyond acceptable limits (Table 3), indicating a poor fit of model to data. The variances explained by its corresponding motives in the model were 17.7% (home) and 20.5% (restaurant) for healthy meal choices and 12.9% (home) and 9.4% (restaurant) for sustainable meal choices. Constraining all motive-choice paths to be equal across conditions yielded a non-significant change in chi-square, $\Delta\chi^2 = 10.00$ (Δ $df = 5$), $p = .075$, indicating that the influence of motives is similar for home and restaurant meal choices. Path estimates in Table 4 show that strong health motives were associated with healthier as well as more sustainable choices, and sustainable motives with more sustainable choices on the menu choice task. Although we did not find that home and restaurant meal choices are influenced by different motives, it should be noted that the mean scores presented in Table 1 reveal that the five motives were ranked in a different order of importance in both contexts. To compensate for the limited information provided by the model, we therefore additionally examined the prioritization of all five food choice motives across contexts.

Healthiness was ranked as the most important factor for choosing home meals, sequentially followed by sensory appeal, social motives, price, and sustainable motives. For restaurant meals, health motives were ranked third most important after sensory appeal (first) and social motives (second), while price and sustainable motives were ranked fourth and fifth. Five independent samples' t-tests were performed to examine whether each motive was considered more important in one of the two contexts. A Bonferroni correction was applied to correct for multiple comparison errors. Dividing $p = .05$ by the number of individual comparisons made ($k = 5$) indicated $p = .010$ as an appropriate threshold for assuming significant effects. Health motives, $t\,(299) = 8.71$, $p < .001$, $d = 1.00$, sustainable motives, $t\,(299) = 2.75$, $p < .001$, $d = 0.32$, and price motives for food choice, $t\,(299) = 4.23$, $p < .001$, $d = 0.49$, were significantly stronger in home context than in the restaurant context. In contrast, participants reported stronger sensory motives, $t\,(299) = -4.47$, $p < .001$, $d = -0.52$, and social motives, $t\,(299) = -5.57$, $p < .001$, $d = -0.64$, with respect to restaurant meals compared to home meals. In favor of our hypothesis, these results suggest that food choice motives are indeed context-dependent and that people may wish to prioritize their choices differently at home and at a restaurant – for instance by temporarily favoring tastiness over healthiness when choosing restaurant meals.

3.3.3. Comparing the role of values and motives

Finally, we compared the relative importance of personal values against food choice motives, for explaining context-specific meal choices. It was hypothesized that motives play a larger role than values in explaining restaurant as compared to home meal choices. The two nested models were fitted to subsets of data from the home and restaurant conditions separately, of which model fit indices are displayed above in Table 3. Comparing the chi-square difference and other model fit indices between the motives-only and values-only model for each context, it seems that motives have a larger influence than values regardless of the context, although the difference is smaller in the home meal condition ($\Delta\chi^2 = 21.32$) than in the restaurant meal condition ($\Delta\chi^2 = 34.66$). However, when additionally considering the evidence that we presented in section 3.3.1. and 3.3.2, it must be concluded that the influence of motives exceeds that of values primarily in relation to healthy choices but not so much for sustainable choices. The differences between values and motives in terms of the variance they explained in healthy meal choices were Δ17.0% for home meals and Δ20.0% for restaurant meals. For sustainable meal choices, these differences were only Δ-3.5% for home meals and Δ0.2% for restaurant meals, hence suggesting that values and motives have a more similar influence on food choice sustainability as compared to food choices in the healthy domain. Finally, it should be noted that neither the motives-only model nor the values-only model provided fit indices that met up to the criteria for acceptable model fit. Upon comparison of the three models, it should therefore be concluded that the original model, in which both values and motives were retained, fits the data best.

4. Discussion

The aim of the present research was to explore how food choices are made across different contexts. Specifically, we examined to what extent personal values and food choice motives may have a different influence on the healthiness and sustainability of food choices when selecting home meals versus restaurant meals. In line with our first hypothesis, our findings revealed that participants in the restaurant condition chose unhealthy meals more often than participants in the home condition. However, contrary to our expectations, no such difference was observed with respect to choosing sustainable meals. Furthermore, differences between home meals and restaurant meals were observed for one out of three values included as predictors of food choices in the path model, thereby partly confirming our second hypothesis. Self-transcendence values had a larger influence on sustainable meal choices in the home context, although a significant relationship was found for restaurant meal choices as well. Strong conservation values predicted fewer sustainable choices on the menu task equally for home and restaurant meals but appeared irrelevant for healthy food choices in both contexts. As expected, our results also showed that participants in the restaurant condition prioritized their food choice motives differently than participants in the home condition, attributing greater importance to the sensory appeal of food and eating together with others, while the healthiness, sustainability, and pricing of restaurant meals mattered less. Lastly, motives had a larger influence on healthy choices than values when choosing home as well as restaurant meals, while their influence on sustainable choices appeared more equal in both contexts.

Previous research has established that people tend to eat unhealthier when at a restaurant, with a higher total energy intake and a lower intake of micronutrients (Lachat et al., 2012; Todd et al., 2010). Findings from the present study broadly support these claims, showing that participants in the restaurant condition opted for unhealthier meals more often than those in the home condition. However, this accordance with prior literature did not apply to the domain of food choice sustainability in the present study. Our study finds that meat-based options were chosen just as often by participants from both conditions, showing a preference for meat options over their equivalent but plant-based alternatives for restaurant as well as home meals. This finding is at odds with previous findings from Horgan et al. (2019) and Biermann and Rau (2020), who both reported an increased tendency for eating meat in restaurants. A possible explanation for this might be that participants in our sample reported an average of eating meat six out of seven days a week, implying that meat was already an integral part of their everyday meals at home. As a consequence, it is likely that many of the participants never considered choosing plant-based meals as an option at all. To avoid this issue in future studies, we recommend ensuring more diversity in terms of habitual meat-consumption tendencies within their sample by including occasional meat eaters and optionally also vegetarians.

Regarding the role of personal values and food choice motives in explaining home-compared to restaurant meal choices, our findings partially supported our hypothesis: self-transcendence values were a relevant predictor of sustainable meal choices but, in line with our expectations, the observed relationship was stronger for home meal choices. In contrast, results showed a more consistent relationship between conservation values and sustainable meal choices across contexts, such that holding conservative values predicted fewer sustainable choices for home meals as much as for restaurant meals. The strength of value-choice relations observed here follows similar patterns as previously described by Bardi and Schwartz (2003), in a study where the strength of relationships between various value types and their corresponding behaviors were compared. They found that overall, value-behavior relations were strongest for traditional values, a key element of conservation values that has been linked to higher meat consumption tendencies (e.g., Ruby, 2012). For universalism values, a key element of self-transcendence and verified predictor of sustainable behaviors (de Groot & Steg, 2008; Schwartz & Boehnke, 2004; Steg, 2008), only moderate associations with corresponding behaviors were found. These naturally existing differences between value types and how they express in behaviors over time, might explain why conservation values were found to be a more stable predictor of (un)sustainable choices between contexts than self-transcendence values in the present study.

Nevertheless, the direction of the observed relationships between personal values and sustainable food choices did correspond well to prior research. Multiple studies have demonstrated a more pleasurable perception of eating meat as well as higher consumption of meat products in people with strong conservation values, while self-transcendence values have conversely been associated with being supportive of meat reduction and vegetarianism (Allen et al., 2000; Allen & Ng, 2003; Hayley et al., 2015; Kumpulainen et al., 2018; Ruby, 2012). Although various studies have linked conservation and self-transcendence values to healthy food choices as well (Hansen et al., 2017; Hansen & Uth Thomsen, 2018), personal values appeared irrelevant predictors of healthy meal choices in the present study, regardless of the context. It is difficult to explain this result, but it could be attributed to the overall weaker associations that seem to exist between Schwartz's values and healthy food choices. The broad value types identified by Schwartz (1992) are strongly oriented toward interpersonal relationships, while health behaviors are most likely to be guided by self-oriented values (e.g., French et al., 2001). For this reason, the broad values of self-transcendence, conservation, openness to change and self-enhancement used to predict food choices in this study may not be the most appropriate for predicting healthy meal choices. Future studies about healthy eating should consider using an alternative measure that covers internal values as well, such as hedonic values or enjoyment (Chryssohoidis & Krystallis, 2005).

The largest differences between home and restaurant meal choices that emerged from this study involved the prioritization of food choice motives. The sensory quality (i.e., taste, smell, visual appeal) of food and pleasurable social interaction were perceived as significantly more important for restaurant meals compared to home meals. Inversely, healthiness, sustainability, and price were more important for home meals than restaurant meals. Although we did observe a difference in the importance of food sustainability when choosing home and restaurant meals, it was striking that sustainability was ranked the least important of all motives by participants in both contexts. A possible explanation for this may be that they lacked an adequate understanding of what sustainability in relation to food means, or that they give priority to other considerations in everyday choices. Further evaluation of the findings confirms that there are similarities between the contextual differences observed in this study and those previously described by Biermann and Rau (2020) and Allman-Farinelli et al. (2019). Their findings showed that meal healthiness, environmental impact, and low financial costs mattered more for home meals, while for restaurant meals, tastiness was more important and healthiness mattered less. Other studies have suggested similar increases in the importance of sensory attributes of food in restaurant settings (Hein et al., 2012; Meiselman et al., 2000). The consistency of our results with these earlier findings strengthens the premise that people assign different meanings to restaurant meals and have different expectations about their eating experience compared to home meals.

With respect to the influence of food choice motives, we observed no differences between home and restaurant meals. We found that individuals with strong sustainability motives favored plant-based over meat-based meals on the menu task and those who were motivated to eat healthily made both healthier as well as more sustainable food choices, regardless of context. However, it should be highlighted the inclusion of only two motives as predictors in the path model limits the ability to draw conclusions about food decision-making in more complex and realistic contexts, where additional factors such as meal pricing, social setting, and sensory appeal can influence healthy or sustainable choices (e.g., Hoek et al., 2017; Pollard et al., 1998). A possible reason for this could be that, besides the labels for healthy or sustainable meals, no other meal-related attributes were explicitly communicated to participants. For instance, meal prices were not specified on the menu, which may have reduced or eliminated price considerations as a motive for decision-making. Similarly, participants received no explicit clues about the social setting in which they selected home and restaurant meals. For sensory motives, the lack of relevance for meal choices is more difficult to explain, considering that expectations about a dish's taste and smell are based on how it is described on the menu (Wansink et al., 2005). Moreover, expectations about inferior taste can be a barrier to choosing healthy or plant-based meal options (Lea & Worsley, 2003; Newson et al., 2015; Raghunathan et al., 2006). Nevertheless, it cannot be ruled out that the inadequate internal reliability of the subscale was the reason why sensory motives appeared irrelevant as predictors of food choice in the present study, which is why we advise interpreting these results with caution.

Finally, regarding the influence on eating choices exerted by values compared to motives in both contexts, our findings partially supported our hypothesis. For healthy food choices, the influence of motives exceeded that of values in both consumption contexts alike, but the difference between values and motives was notably smaller in the sustainable domain. Overall, motive-choice relations remained relatively stable across contexts, but findings did reveal some variability in the influence of values on congruent food choices across the home and restaurant context. The patterns observed here are consistent with the theoretical assumption that personal values are stable and generic (Steg et al., 2014), whilst motives are transient and adaptive to specific eating situations, moments, and contexts (e.g., Phan & Chambers, 2018). Given the equally changeable nature of people's behavior, it was natural to observe that motives predicted food choices better across different contexts, while the observed value-choice relations were more variable.

4.1. Strengths and limitations

Strengths of the study include the study sample's diversity in terms of age and educational level and the use of an experimental choice task to assess the outcome measures. The menu choice task allowed for real-time assessment and evaluation of participants' food choices, rather than relying on retrospective reporting of past behaviors. Also, choice experiments tend to be less sensitive to social desirability bias than self-report measures of eating behaviors. This study was limited in terms of its ability to draw conclusions about causes and effects due to its cross-sectional design. It should be noted, however, that the structure of relations proposed here – with consumption context influencing people's food choice motives, how they evaluate their choice options, as well as food selection – has been consistently demonstrated in the literature (e.g., Hein et al., 2010, 2012; Jaeger & Rose, 2008; King et al., 2004; Machín et al., 2014; Meiselman et al., 2000). Another limitation lies in

the fact that consumption contexts were hypothetically created through semantical differentiation and that choice behavior was not examined in actual home and restaurant contexts. Since, it is difficult to rule out the possibility that there are other factors that could influence decision-making in each context, the generalizability of these findings to real-life situations is limited. It should be highlighted, however, that semantic task- and questionnaire-framing can provide a useful tool for practice-oriented research in online surveys, considering that it was demonstrated to be effective in eliciting contextual associations and meanings from participants in prior research (e.g., Biermann & Rau, 2020; Hein et al., 2010, 2012). Although this underlines the credibility of context-framing in the present study, results should be interpreted with caution until follow-up research has confirmed that similar patterns exist in the field. Another limitation is that this study's data were collected exclusively in a Modern Western culture, knowing that some personal value types do not exist in all cultures, or may have slightly different meanings. Further work is needed to determine whether these results would hold up in other cultures.

5. Conclusion

The present study has enhanced our understanding of contextual differences in food choices by providing a comparison of how personal values and food choice motives influence decision-making for home and restaurant meals. The findings showed that motives are more useful than values for explaining healthy meal choices across different contexts, whereas the influence of values and motives appeared more similar for sustainable choices. With respect to sustainable meal choices, we observed that value-choice relations were more variable than motive-choice relations, with self-transcendence values being less predictive of sustainable choices in the restaurant context than in the home context. To our knowledge, this study was the first to examine and compare choices for home and restaurant meals through an online menu choice task. Given that differences were observed between home and restaurant meal choices even when these contexts were purely hypothetical, strengthens the idea that contextual factors and expectations can shape how people make decisions about food. Further research could benefit from including a larger and more diverse sample and field studies need to be carried out to examine the broader range of factors that influence decision-making in more complex and realistic settings.

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Availability of data and materials

Data and materials used for the present research can be accessed upon request via the corresponding author.

Ethical statement

The study was approved by the Ethics Committee of the Faculty of Social and Behavioural Sciences of Utrecht University on December 13, 2021. The approval is based on the documents send by the researchers as requested in the form of the Ethics committee and filed under number 21–0487.

Author contributions

DdR, MG, and IC contributed to the conceptualization of the research and design of the study. IC conducted statistical analyses and wrote the initial draft of the paper. DdR, MG, and IC edited and revised this into the current version of the manuscript. All authors have approved the final article before submission.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Iris W. H. Claessens reports financial support was provided by Regio Deal Foodvalley.

Data availability

Data will be made available on request.

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APPENDIX A

Factor analysis results food choice questionnaire

An 18-item Food Choice Motives scale was originally developed, consisting of six subscales: health motives, sensory motives, familiarity and convenience motives, sustainability motives, price motives, and social motives. Evaluation of the subscales revealed a negative Cronbach's Alpha reliability for the familiarity and convenience subscale, which most likely resulted from combining two incompatible motives into one subscale. This subscale was therefore excluded from further analyses. A confirmatory factor analysis with Maximum Likelihood estimation was performed for validation of the remaining five-factor structure. Based on this, two items were excluded. The model fit of the final scale with five subscales and 13 items was acceptable, χ^2 (55) = 149.57, $p < .001$, RMSEA = 0.08, CFI = 0.90. Internal consistency was sufficient, as indicated by significant factor loadings (ranging from $\beta = 0.38$ to $\beta = 0.83$; Bagozzi et al., 1991). Measurement invariance was tested by looking at the metric and scalar models in multigroup CFA, $\Delta\ \chi^2$ (34) = 20.17, $p = .971$, indicating that food choice motives were measured the same for the home and restaurant meal conditions.

APPENDIX B

Food choice motives questionnaire

ENGLISH (translated)

Home context: When I eat at home …
Restaurant context: When I eat out …

1. … I don't pay attention to whether the meal is healthy.
2. … I pay attention to whether the meal tastes good.
3. … I pay attention to whether the meal is locally produced.
4. … I pay attention to whether the meal is cheap.
5. … I pay attention that the meal is nutritious.
6. … I don't pay attention to whether the meal looks good.
7. … I pay attention to whether the (main) ingredients of the meal have been produced in an animal-friendly way.
8. … I pay attention to whether the meal is enjoyable.
9. … I pay attention that the meal contains a lot of vegetables.
10. … I pay attention that the meal smells good.
11. … I don't pay attention to whether the (main) ingredients of the meal have been produced in a sustainable way.
12. … I don't pay attention to the price of the meal.
13. … I pay attention to whether the meal is atmospheric and relaxing.

Health = 1R, 5, 9.
Sensory = 2, 6R, 10.
Sustainable = 3, 7, 11R.
Price = 4, 12R.
Social = 8, 13.

DUTCH (original)
Home context: Als ik thuis eet …
Restaurant context: Als ik uit eten ga …

1. … let ik er niet op of de maaltijd gezond is.
2. … let ik erop dat de maaltijd lekker smaakt.
3. … let ik erop dat de maaltijd lokaal geproduceerd is.
4. … let ik erop dat de maaltijd goedkoop is.
5. … let ik erop dat de maaltijd voedzaam is.
6. … let ik er niet op of de maaltijd er goed uitziet.
7. … let ik erop dat de (hoofd)ingrediënten van de maaltijd op een diervriendelijke manier geproduceerd zijn.
8. … let ik erop dat de maaltijd gezellig is.
9. … let ik erop dat de maaltijd veel groenten bevat.
10. … let ik erop dat de maaltijd lekker ruikt.
11. … let ik er niet op of de (hoofd)ingrediënten van de maaltijd op een duurzame manier geproduceerd zijn.
12. … let ik niet op de prijs van de maaltijd.
13. … let ik erop dat de maaltijd sfeervol en ontspannen is.

APPENDIX C

Menu choice task

Pictograms

Fig. 1. "Healthy" pictogram

Fig. 2. "Sustainable" pictogram

Menu choice trials

ENGLISH (translated)	DUTCH (original)
Trial 1	**Trial 1**
1. Veggie burger with salad[ab]	1. Groenteburger met salade[ab]
2. Hamburger with fries.	2. Broodje hamburger met frites
3. Veggie hamburger with fries[b]	3. Broodje vegaburger met frites[b]
4. Beef burger with salad[a]	4. Runderburger met salade[a]
Trial 2	**Trial 2**
1. Pancake with syrup[b]	1. Pannenkoek met stroop[b]
2. Mashed potato stew with sausage[a]	2. Stamppot met worst[a]
3. Pancake with bacon	3. Pannenkoek met spek
4. Mashed potato stew with veggie sausage[ab]	4. Stamppot met vegaworst[ab]
Trial 3	**Trial 3**
1. Schnitzel with fries	1. Schnitzel met frites
2. Vegetable casserole with veggie mince[ab]	2. Groenteschotel met vegagehakt[ab]
3. Veggie schnitzel with fries[b]	3. Vegaschnitzel met frites[b]
4. Vegetable casserole with veggie mince[a]	4. Groenteschotel met gehakt[a]
Trial 4	**Trial 4**
1. Meat stew with vegetables[a]	1. Vleesstoofpotje met groentes[a]
2. Veggie stew with vegetables[ab]	2. Vegastoofpotje met groentes[ab]
3. Veggie croquette with fries[b]	3. Vegakroket met frites[b]
4. Croquette with fries	4. Kroket met frites
Trial 5	**Trial 5**
1. Pasta with vegetables and veggie mince[ab]	1. Pasta met groentes en vegagehakt[ab]
2. Lasagne with minced meat	2. Lasagne met gehakt
3. Pasta with vegetables and minced meat[a]	3. Pasta met groentes en gehakt[a]
4. Lasagne with veggie mince[b]	4. Lasagne met vegagehakt[b]

[a] Healthy meal option.
[b] Sustainable meal option.

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