



Contents lists available at ScienceDirect

# Food Quality and Preference

journal homepage: [www.elsevier.com/locate/foodqual](http://www.elsevier.com/locate/foodqual)

## Ready meals that look hot increase consumers' willingness to pay for plant-based options

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### ARTICLE INFO

#### Keywords:

Packaging  
Willingness to pay  
Temperature  
Ready meal  
Plant-based

### ABSTRACT

This study investigates consumers' perception of plant-based and meat-based ready meals, focusing on ratings of tastiness, freshness, healthiness, and willingness to pay (WTP). Our findings reveal that plant-based ready meals are perceived as looking less tasty, and consumers exhibit a decreased WTP when compared to meat-based alternatives, despite the plant-based options being perceived as healthier. We further explore whether the visual cueing of a hot meal on food packaging can influence consumer evaluations. Specifically, we examine the effect of adding steam – a visual indicator of heat – to images on frozen food packaging. The results demonstrate that the presence of steam enhances perceived food temperature and freshness ratings for both plant-based and meat-based ready meals. Notably, increased temperature perception leads to a higher WTP, but only for plant-based products. Mediation analysis reveals that for plant-based ready meals, the impact of heightened temperature perception on WTP is mediated by increased perceived tastiness. These findings have significant implications for nudging consumers towards healthier food choices. By leveraging visual temperature cues in packaging design, it may be possible to enhance the appeal of plant-based ready meals, thereby encouraging more sustainable and health-conscious consumer behaviour.

### 1. Introduction

The rise of plant-based alternatives as substitutes for animal-based foods has marked a significant shift in the marketplace. This trend is even more relevant now given that recent research has found that animal-based ultra-processed foods are notably associated with increased risk of multimorbidity, whereas no such association was found for plant-based alternatives (Cordova et al., 2023). It thus becomes increasingly important to explore strategies to nudge people toward preferring plant-based food alternatives. Currently, consumers exhibit a lower willingness to pay (WTP) for plant-based meal alternatives (Castellari, Marette, Moro, & Schokai, 2019). This is largely due to the low acceptance of alternative products and the perception that these options may lack tastiness (Michel, Hartmann, & Siegrist, 2021).

Beyond tastiness, perceived freshness and healthiness are also important factors influencing consumers' food choices. Freshness, often associated with higher quality and better flavour, is a key determinant in consumers' food purchasing decisions (Lund et al., 2006). Relevant to this, indicators of organic and clean label attributes, which consumers often link with freshness and healthiness, increase people's WTP for

ready meals (Uddin & Gallardo, 2021). Alsubhi et al.'s (2023) systematic review of consumer WTP for healthier food products corroborates this, demonstrating that consumers are willing to pay a significant premium for healthier options. Given these insights, the current study compares the perceived tastiness, freshness, and healthiness of plant-based and meat-based food products as key attributes influencing consumer food preferences.

The perceived (or anticipated) temperature of food plays a crucial role in shaping consumers' evaluations of deliciousness. Food warmth stimulates appetite, and hot foods enhance deliciousness and satiety (Rodríguez, Masuko, & Yamanaka, 2022; Talavera et al., 2005; Yamim, Mai, & Werle, 2020). However, a disconnect exists between hot food labelled as "ready" on packages and the reality that these items are typically chilled or frozen at the point of purchase. When the intended temperature cannot be perceived through haptic sensation, visual cues (e.g., labels, light colour in food photography, and steam textures) can cross-modally convey hot temperature perception (see Gil-Pérez et al., 2020; Spence, 2020, for a review; Yamim et al., 2020; Zhang et al., 2024). For ready meals, especially frozen ones, visual cues indicating hot temperature may be particularly beneficial in bridging the gap

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<https://doi.org/10.1016/j.foodqual.2024.105277>

Received 4 April 2024; Received in revised form 14 June 2024; Accepted 17 July 2024

Available online 18 July 2024

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between the consumer's craving for a hot meal and the product's actual (i.e., frozen) state. With the widespread availability of ready-made frozen food, including plant-based options, we compare the perceived temperature of plant-based and meat-based ready meals depicted on the packages and investigate the relationship between perceived temperature and food tastiness, freshness, and healthiness.

When making food purchasing decisions, consumers often refer to the product's packaging, where images of the food contained within present product-related information (Underwood & Klein, 2002; Velasco & Spence, 2019). Attributes of food package imagery can anchor consumers' judgments and affect their evaluation and perception of a product (Gil-Pérez, Rebollar, & Lidón, 2020; Petit, Velasco, & Spence, 2018). Visual indicators that food is hot, such as steam textures, can be incorporated into packaging design. Steam, which is semantically associated with heat due to our everyday experience with moist hot foods and drinks, has been shown to increase perceived temperature when digitally added to food images (Yamim et al., 2020; Zhang et al., 2024). Recent research by Zhang et al. (2024) found that steam rising from food images effectively elevated the perceived temperature and food desirability, with a particularly strong effect on those foods that are less enticing to begin with. This finding suggests that plant-based foods, which are often perceived as less appealing, may benefit more from such visual augmentation, thus helping to close the gap with meat-based options. We hypothesized that package images displaying steam textures should increase the perceived temperature of depicted ready meals, leading to more positive evaluations, with a potentially greater effect on plant-based meals than meat-based ones.

Reflecting on the continued growth of the online food and grocery market (Statista, 2023), and to ensure ecological validity in the evaluation of ready meal packages, we conducted an online survey to address our research questions. Consumers' perceptions of food temperatures, tastiness, freshness, healthiness, and WTP for the food were compared between meat-based and plant-based meals. Simultaneously, we investigated the effectiveness of adding a visual temperature cue (i.e., steam texture) to ready meal package images in elevating the perceived temperature and its downstream effects on tastiness, freshness, and WTP.

## 2. Methods

A  $2 \times 2$  factorial design was used to address the research objectives in an online survey on Qualtrics (<https://www.qualtrics.com/uk/>). There were two within-group factors: food type (meat-based vs. plant-based) and image type (steam-added vs. no-steam control), where the food images were modified with (vs. without) steam texture. Four different sets of food images were used, of which two were meat-based and two were plant-based. For each food image, each participant saw either the no-steam original or the steam-added version.

### 2.1. Participants

200 UK residents were recruited from the online crowdsourcing platform Prolific (<https://app.prolific.com/>) to take part in this study in exchange for £0.40 in February 2024. The targeted participants were adults without colour-blindness as colour perception may affect their evaluation of food packaging pictures. The participants had a mean age of 41 years ( $SD = 13$  years) and were predominantly female (78%). 173 participants reported that they eat meat on a weekly basis or more frequently (86.5%), 27 participants eat meat less than once a month or do not eat meat at all (13.5%), which is similar to the share of UK residents who do not eat meat (Statista, 2024). A total of 32 (16%) participants reported that they consume ready meals a few times a week or even on a daily basis. 108 participants (54%) claimed that they have a ready meal from once a week to once a month. The remaining 60 participants (30%) reported rarely eating ready meals. As our results showed that dietary preference and the frequency of eating ready meals did not influence the results, these variables are not discussed in the

analysis. All participants passed the attention check, and none reported encountering any technical issues.

### 2.2. Stimuli and procedure

Before the survey, participants provided informed consent and indicated how hungry they were as a control measure. Next, the participants were instructed to imagine that they had walked into a supermarket and were standing in front of the fridges where ready meals were on display. Along with this instruction, the participants were provided with a picture of supermarket ready-to-eat aisles to help them contextualise the situation, i.e., that they would be evaluating ready-to-eat foods based on the picture of the packaging and that the foods were cold, as they would normally be in the refrigerators (see Fig. S1).

A full-factorial within-group design was adopted. Each participant was presented with all conditions, i.e., meat-based food without/with steam texture and plant-based food without/with steam texture. There were four sets of ready meal pictures with two different meat-based foods (beef lasagne and pepperoni pizza) and two plant-based options (vegetarian lasagne and mushroom pizza). The stimuli were sourced from <https://www.quorn.co.uk/> and <https://www.goodfellaspizzas.com/>. For each set of ready meal images, the participant saw either the no-steam original version or the steam-added version (see Fig. 1 for a demonstration of the stimuli used in the study and Fig. S1 for a full list of stimuli). The stimuli were pre-tested with 100 participants, with 50 participants evaluating the original food packages (i.e., control condition stimuli) and 50 participants evaluating the steam-added pictures (i.e., experimental condition stimuli). The results of the pre-test revealed that there were no significant differences between each set of food package images (control vs. steam-added) in terms of their appeal and ratings of the tastiness of the food displayed (detailed results are presented in Table S1).

In the main study, each participant viewed four pictures, with one picture for each condition. Food type (meat-based vs. plant-based) and image type (steam-added vs. no-steam control) conditions were entirely balanced and randomized for each participant. After viewing each image, the participants rated the expected temperature of the food ("1 = extremely cold" to "9 = extremely hot"). The participants evaluated how "tasty", "freshly made", and "healthy" the food looked on 7-point scales, and WTP was assessed by asking the participants the maximum amount they would be willing to pay for the ready meal on a slider scale ranging from £0 to £5. After the main survey, the participants indicated whether they encountered any technical issues, their gender, age, frequency of eating ready meals, and their frequency of eating meat. All survey items are provided in detail in Supplementary Table S2.



Fig. 1. Demonstration of the stimuli used in the study. The left panel is the package image used in the control group, and the image on the right has been retouched with steam added above the food.

### 2.3. Data analysis

A series of two-way repeated measures ANOVAs were conducted in R (R Core Team, 2022) to test the effect of image type (steam-added vs. no-steam control) and to compare the differences between meat-based food products and plant-based alternatives on perceived temperature, anticipated tastiness, freshness, healthiness, and WTP. For significant interaction effects, Bonferroni-corrected post hoc pairwise comparisons were conducted. The relationships between outcome variables were further investigated. Specifically, the role of temperature perception (i.e., the immediate outcome of the steam textures as a visual temperature cue), on anticipated food tastiness, freshness, healthiness, and WTP was explored. Regression analyses were therefore conducted with temperature as the independent variable, and food tastiness, freshness, healthiness, and WTP as the dependent variables. Further mediation analyses were conducted using PROCESS v4.2 macro by Hayes (2022) with 10,000 bootstrapped samples (Model 4), to understand the mechanism of increased temperature perception leading to the increased WTP, with tastiness, freshness, and healthiness of the food as the testing mediators.

## 3. Results

### 3.1. Effects of image type and food type on temperature, anticipated tastiness, healthiness, freshness and consumers' WTP

Descriptive statistics of dependent variables, including temperature perception, tastiness, healthiness, freshness and WTP are summarized in Table 1.

#### 3.1.1. Main effects of food type: Comparing meat-based and plant-based ready meals

There was a significant main effect of food type (meat-based vs. plant-based) on several dependent variables. First, perceived temperature differed between the two food types,  $F(1, 199) = 37.56, p < 0.001, \eta_g^2 = 0.023$ . Notably, participants rated meat-based ready meals as having a higher temperature ( $M = 5.97, SE = 0.11$ ) than the plant-based meals ( $M = 5.37, SE = 0.12$ ) solely based on viewing the food images on the packages (Fig. 2A), underscoring an inherent bias in temperature perception between the two food types. There was also a significant main effect of food type on perceived tastiness ( $F(1, 199) = 50.65, p < 0.001, \eta_g^2 = 0.048$ ; see Fig. 2B), and healthiness ( $F(1, 199) = 69.22, p < 0.001, \eta_g^2 = 0.037$ ; see Fig. 2C). The means indicate that the meat-based meals ( $M = 4.68, SE = 0.10$ ) were considered tastier than the plant-based foods ( $M = 3.93, SE = 0.10$ ). In contrast, plant-based products were regarded as healthier ( $M = 3.35, SE = 0.09$ ) than the meat-based meals ( $M = 2.75, SE = 0.08$ ). No significant effect of food types was

**Table 1**

Means and standard deviations for temperature, tastiness, freshness, healthiness, and WTP as a function of package photo with/without steam texture.

		Meat-based	Plant-based
Original package (Control)	Temperature***	5.60 ± 1.88 <sup>a</sup>	4.88 ± 1.79 <sup>b</sup>
	Tastiness	4.65 ± 1.59 <sup>a</sup>	3.83 ± 1.73 <sup>b</sup>
	Freshness*	3.02 ± 1.73	2.95 ± 1.67
	Healthiness	2.72 ± 1.50 <sup>a</sup>	3.34 ± 1.61 <sup>b</sup>
	WTP*	2.72 ± 0.97 <sup>a</sup>	2.38 ± 1.06 <sup>b</sup>
Package with added steam	Temperature***	6.34 ± 1.85 <sup>a</sup>	5.86 ± 2.25 <sup>b</sup>
	Tastiness	4.70 ± 1.63 <sup>a</sup>	4.03 ± 1.77 <sup>b</sup>
	Freshness*	3.26 ± 1.67	3.14 ± 1.70
	Healthiness	2.78 ± 1.46 <sup>a</sup>	3.36 ± 1.52 <sup>b</sup>
	WTP*	2.68 ± 0.98	2.58 ± 0.94

\*\*\* $p < 0.001$ , and \* $p < 0.05$  indicating significant differences between original package (control) and steam added package. a, b indicates significant differences between meat-based and plant-based food images. WTP stands for willingness to pay.

observed on people's ratings of freshness,  $F(1, 199) = 1.76, p = 0.186, \eta_g^2 < 0.001$ .

#### 3.1.2. Main effects of image type: Comparing steam-added and no-steam package images

Repeated measures ANOVAs revealed significant main effects of image type (steam-added vs. no-steam control) on both perceived temperature and the rated freshness of the food depicted in the ready meal images. The addition of steam significantly increased perceived temperature ( $F(1, 199) = 48.15, p < 0.001, \eta_g^2 = 0.046$ ; see Fig. 3A), apparent freshness ( $F(1, 199) = 7.34, p = 0.007, \eta_g^2 = 0.004$ ; see Fig. 3B), and WTP ( $F(1, 199) = 4.02, p = 0.046, \eta_g^2 = 0.002$ ; see Fig. 4). Paired comparisons (see Table 1) indicate that adding steam increased the perceived temperature and freshness of both the meat-based and plant-based dishes (no-steam control: temperature:  $M = 5.24, SE = 0.11$ ; freshness:  $M = 2.98, SE = 0.11$ ; steam-added: temperature:  $M = 6.09, SE = 0.13$ ; freshness:  $M = 3.19, SE = 0.10$ ). Interestingly, image type did not exert a main effect on either tastiness ( $F(1, 199) = 2.10, p = 0.149, \eta_g^2 = 0.001$ ) or healthiness ( $F(1, 199) = 0.31, p = 0.578, \eta_g^2 < 0.001$ ). This suggests that while steam effectively conveys impressions of hot temperature and freshness, it does not directly influence perceptions of a food's flavour or nutritional value.

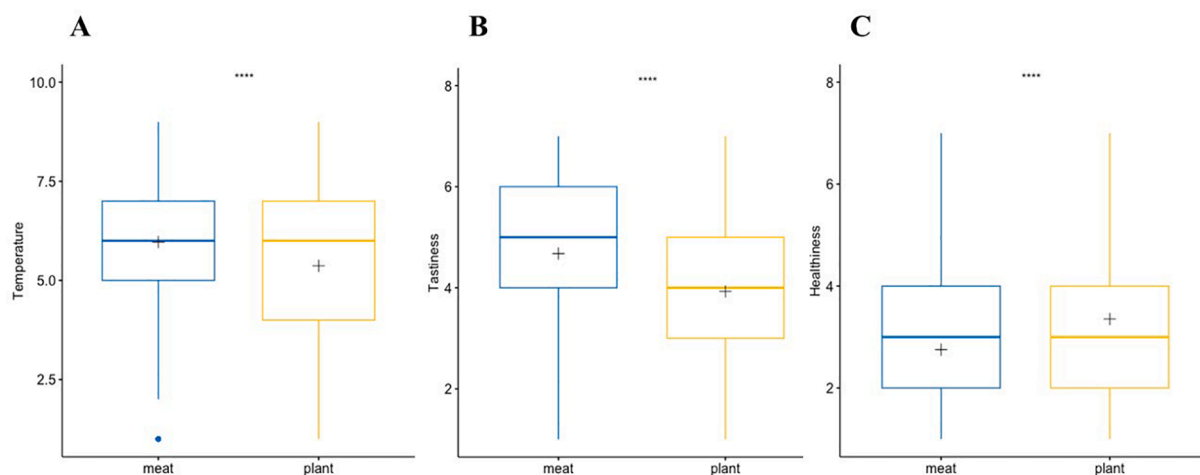
#### 3.1.3. The interaction effects of image type and food type

There was a significant image type (steam added vs. no-steam control) by food type (meat-based vs. plant-based) interaction on WTP,  $F(1, 199) = 6.33, p = 0.013, \eta_g^2 = 0.004$  (see Fig. 4). Pairwise comparisons revealed that with original packaging, WTP for plant-based ready meals was significantly lower than for meat-based ones with the original packaging images, Bonferroni-corrected  $p < 0.001$ . However, after adding steam to the food image there was no difference in WTP between the plant-based and meat-based ready meals, Bonferroni-corrected  $p = 0.131$ . Post hoc analyses also showed that visual temperature cue increased WTP for plant-based foods (steam added:  $M = 2.58, SE = 0.07$ ; control:  $M = 2.38, SE = 0.07$ , Bonferroni-corrected  $p = 0.002$ ) but not for meat-based ones (steam added:  $M = 2.68, SE = 0.07$ ; control:  $M = 2.71, SE = 0.07$ , Bonferroni-corrected  $p = 0.540$ ). There was no significant interaction effect between image type and food type for the other variables: temperature,  $F(1, 199) = 1.73, p = 0.189, \eta_g^2 < 0.001$ ; tastiness ( $F(1, 199) = 0.58, p = 0.447, \eta_g^2 < 0.001$ ); freshness,  $F(1, 199) = 0.09, p = 0.767, \eta_g^2 < 0.001$ ; or healthiness ( $F(1, 199) = 0.02, p = 0.578, \eta_g^2 < 0.001$ ). These results indicate that while steam's presence influenced relative WTP for different food types, it did not differentially affect perceptions of the foods' sensory and health-related attributes.

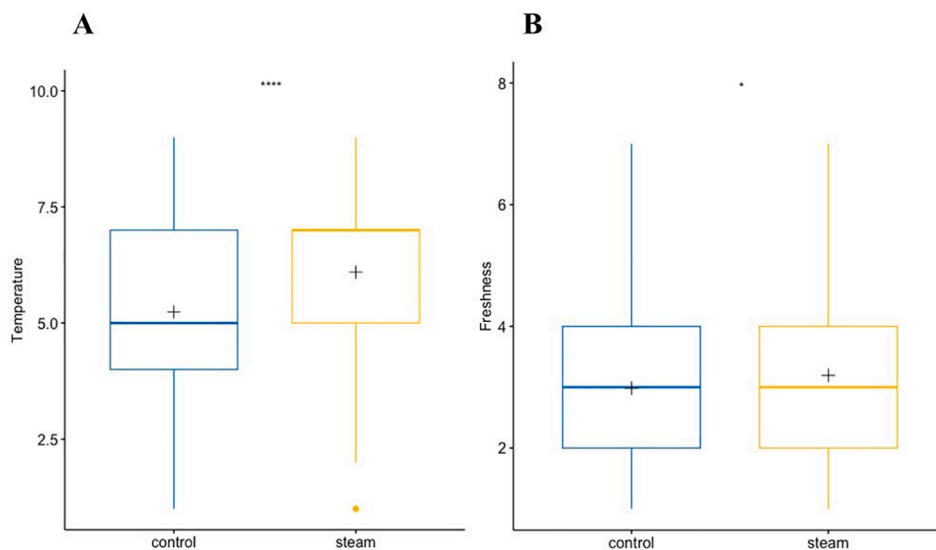
### 3.2. The relationship between temperature and food tastiness, freshness, and WTP

Regression analysis results revealed that perceived temperature significantly predicted food tastiness, freshness, healthiness, and WTP. More specifically, a linear regression confirmed that the temperature of the food depicted significantly influenced the anticipated tastiness of the ready meals displayed ( $\beta = 0.49, SE = 0.04, p < 0.001$ ). That said, when participants perceived the temperature of ready meals to be higher, they increased their rating of the expected tastiness. Temperature perception also positively predicted anticipated freshness ( $\beta = 0.43, SE = 0.01, p < 0.001$ ), healthiness ( $\beta = 0.23, SE = 0.05, p < 0.001$ ), and people's WTP ( $\beta = 0.34, SE = 0.05, p < 0.001$ ).

To explore which of the three factors (i.e., tastiness, freshness, and healthiness) explain the underlying connection between temperature perception and WTP, a parallel mediation model (temperature → tastiness/freshness/healthiness → WTP) was conducted. The results revealed that the effect of food temperature on WTP incrementally operated



**Fig. 2.** Comparison of perceived temperature (A), tastiness (B), and healthiness (C) for meat-based (meat) and plant-based (plant) ready meal packages. The boxplots of the distribution include the lowest and highest data points (whiskers), the first and third quartiles (box extremities), the median (line within the box), the mean (the cross within the box) and any outliers (signposted as dots). \*\*\*\* indicates  $p < 0.0001$  for the significance level of the difference in the means between the two types of ready meals.



**Fig. 3.** Comparison of perceived temperature (A) and freshness (B) for steam-added and no-steam (control) images. The boxplots of the distributions include the lowest and highest data points (whiskers), the first and third quartiles (box extremities), the median (line within the box), the mean (the cross within the box) and any outliers (signposted as dots). \*\*\*\* indicates  $p < 0.0001$  and \* indicates  $p < 0.05$ .

through tastiness ( $ab = 0.10$ , 95 % CI<sup>1</sup> [0.08; 0.12]) and healthiness ( $ab = 0.01$ , 95 % CI [0.00; 0.02]), but not through freshness ( $ab = 0.01$ , 95 % CI [-0.01; 0.02]). To further explore the mediational routes for distinct ready meals, mediation analyses were conducted separately for the meat-based and plant-based ready meals. For meat-based meals, the effect of food temperature on WTP was mediated by tastiness ( $ab = 0.08$ , 95 % CI [0.05; 0.11]) and healthiness ( $ab = 0.02$ , 95 % CI [0.00; 0.04]), but not by freshness ( $ab = 0.01$ , 95 % CI [-0.01; 0.03]), see Fig. 5A. For plant-based foodstuffs, the effect of food temperature on WTP was mediated by tastiness ( $ab = 0.10$ , 95 % CI [0.07; 0.14]). The mediation route through freshness ( $ab = 0.00$ , 95 % CI [-0.02; 0.021]) and healthiness ( $ab = 0.01$ , 95 % CI [-0.00; 0.02]) was not significant, see Fig. 5B. Full mediation results are presented in Table S3–S5.

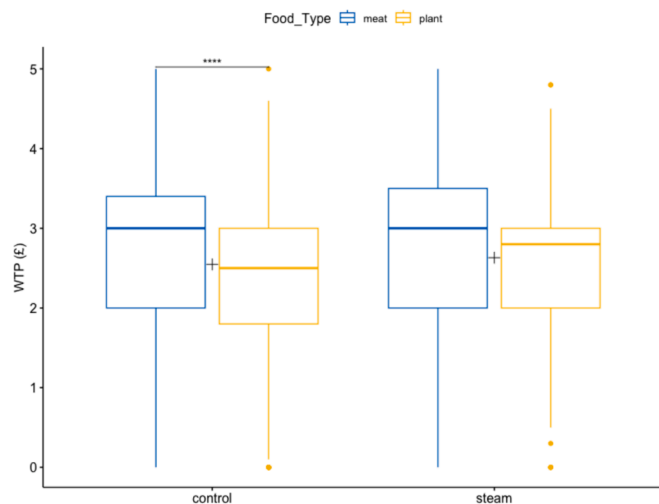
The linear regression and mediation analyses demonstrate that steam

textures printed on ready meal packages signaling hot temperature can effectively increase the perceived temperature which, in turn, positively influences food tastiness, freshness, and healthiness. Separate mediation analyses for meat-based and plant-based meals uncovered distinct pathways through which temperature affects WTP. For meat-based ready meals, both the increased food tastiness and healthiness mediated the relationship between temperature and WTP. However, for plant-based ready meals, only increased food tastiness mediated this relationship. These findings align with the perception of consumers (see Section 3.1.1) that plant-based ready meals are healthier but less tasty than meat-based ones. From the mediational results, temperature enhancement (even when it's primarily visual) is an effective way to narrow consumers' perceived gaps in tastiness and healthiness between plant-based and meat-based foods.

#### 4. Discussion and conclusions

The increasing availability of plant-based alternatives to animal-

<sup>1</sup> CI stands for confidence interval. The 95% CIs here in the results section were formed for the unstandardized effects.



**Fig. 4.** The interaction effect of image type (control vs. steam-added) and food type (meat-based vs. plant-based) on WTP (range: £ 0–5). The boxplots of the distribution include the lowest and highest data points (whiskers), the first and third quartiles (extremities of box), the median (line within the box), the mean (the cross within the box) and any outliers (signposted as dots). \*\*\*\* indicates  $p < 0.0001$ .

based options necessitates a better understanding of consumers' perceptions of these two distinct food types. The current study compared the anticipated food tastiness, freshness, and healthiness of plant-based and meat-based ready meals. The results revealed that consumers consider plant-based foods as being healthier but less tasty than meat-based options, and they expressed a lower willingness to pay for plant-based meals. Notably, incorporating steam texture on product packaging to signal hot temperature effectively increased the perceived temperature of the depicted ready meals. This increase in perceived temperature positively influenced perceptions of tastiness, freshness, and healthiness. Consequently, simply including visual cues to indicate hot food temperature increased the amount of money that people are willing to spend on plant-based ready meals, but not for meat-based ones. For plant-based meals, the impact of increased temperature perception on WTP was mediated by the heightened perceived tastiness. These results demonstrate that by leveraging visual temperature cues in packaging design, it is possible to enhance the appeal of plant-based ready meals by making them appear hotter, thereby potentially increasing consumer preference for these plant-based options.

Inspired by the fact that hot foods enhance deliciousness and satiety, this research further investigated whether incorporating visual cues indicating high temperature on food packaging would influence people's evaluation of ready meals. Ready meals are of particular interest as consumers are presented with cold products that should be served and consumed hot. In this case, visual temperature cues become even more important when the food temperature is not what we want. Our results demonstrate that including steam textures on food packaging images helps to increase the perceived temperature of the frozen foodstuffs. More importantly, this crossmodal approach can further increase the expected tastiness, healthiness, and freshness, in turn enhancing the customer's WTP. These results suggest that a visual (hot) temperature cue to a food package not only signifies a higher temperature, but also enhances people's food evaluations and increases the amount of money that they are willing to spend on the food. The findings reported here are consistent with previous findings on temperature premium effect, showing that food presented at a hotter temperature can increase people's WTP (Yamim et al., 2020). The current study extended this relationship by showing that the relationship between hot temperatures and food valuation is mediated by food tastiness and healthiness. The mechanism also aligns with the "healthy = expensive" intuition (Haws,

Reczek, & Sample, 2017). Further comparisons on the mediational routes between temperature perception and WTP show that tastiness is a significant mediator for plant-based foods, while both tastiness and healthiness significantly mediated the relationship for meat-based foods. Given our findings that consumers perceive plant-based foods as healthier but less palatable than meat-based meals, manipulating perceived food temperature appears to be an effective strategy for enhancing the relative appeal of each food type based on its perceived strengths (e.g., healthy) and weaknesses (e.g., not that tasty).

The difference in the effect of temperature perception on WTP for plant-based versus meat-based meals can potentially be explained by the "warm is more calorie-rich" intuition (Yamim et al., 2020). While plant-based food is often perceived as less filling and less nutritious than meat-based foods (Kerlake, Kemper, & Conroy, 2022), increasing the perceived temperature of plant-based food options may effectively bridge this gap. As recently suggested by Zhang et al. (2024), perceived temperature exerts a stronger effect on those foods that are initially less enticing. The current finding further confirms this suggestion by showing that plant-based foods, which are often perceived to be less appealing, benefited more from such visual enhancements. Interestingly, despite using ultra-processed ready meal pictures as stimuli, where both plant-based and meat-based options should be consumed at a similar temperature, participants nevertheless rated plant-based meals as looking less hot. It is worth exploring further why people perceive plant-based foods to be lower in temperature than meat foods, and how this intuition affects their food choices.

The two main findings of this study are particularly informative and relevant not only for food marketers, but also for those working to shift (nudge) the human diet in a healthier direction. First, we demonstrate that people have an intention to spend more on meat-based foods compared to plant-based foods. Despite the perception that plant-based ready-to-eat foods are healthier, it seems that the tastier options (i.e., meat ready-to-eat foods) are preferred. This suggests that making plant-based foods more appealing and tastier, rather than solely promoting their healthiness, could be a more effective strategy to increase their popularity. Second, our research indicates that adding a simple visual texture cue, such as steam, to indicate higher temperature on food packaging can significantly increase people's perceptions of the food's tastiness and healthiness, thus enhancing their willingness to consume it. This straightforward packaging design approach may be an easy-to-implement strategy to raise expectations of deliciousness for plant-based foods and encourage consumers to choose these meat alternatives.

#### Ethical statement

The study was approved by the Central University Research Ethics Committee of University of Oxford [R85145/RE001].

#### CRediT authorship contribution statement

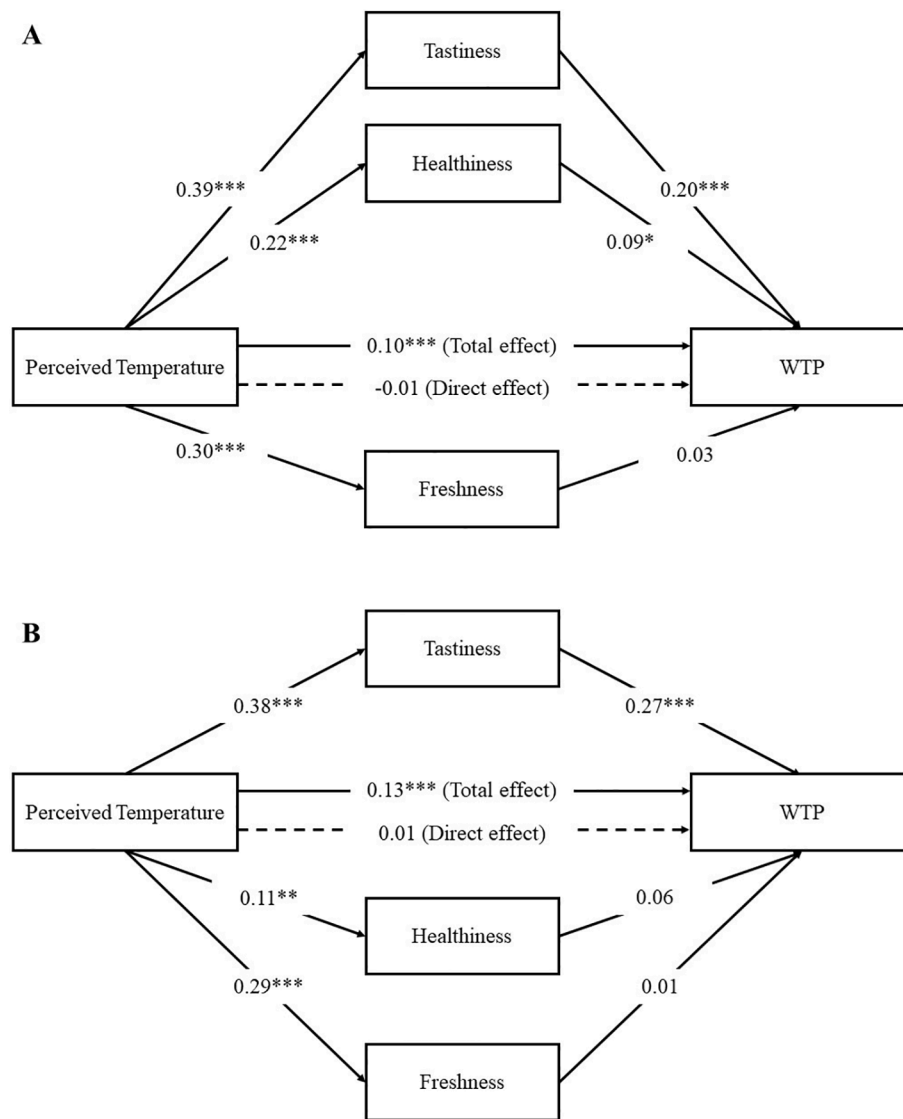
**Tianyi Zhang:** Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Yang Gao:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Charles Spence:** Writing – review & editing, Supervision, Methodology, Conceptualization.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Data availability

Data is available at <https://osf.io/bq56p/>.



**Fig. 5.** Unstandardized regression coefficients for the relationship between perceived temperature and WTP as mediated by anticipated tastiness and healthiness for meat-based (A) and plant-based (B) ready meals. Note: \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ .

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.foodqual.2024.105277>.

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