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What does (not) motivate Gen Z to pay for plant-based milk alternatives? A study on Italian consumers

Sergio Rivaroli^{a,*}, Cristina Calvo-Porrall^b, Rachele Ferretti^c, Davide Giacalone^d,
Ángel A. Carbonell-Barrachina^e, Jörg Lindenmeier^f

^a Department of Agricultural and Food Sciences, Alma Mater Studiorum – Università di Bologna, Bologna, Italy

^b Business Department, Facultad Economía y Empresa, University of A Coruña, Coruña, Spain

^c Department of Agricultural and Food Sciences, Alma Mater Studiorum – Università di Bologna, Bologna, Italy

^d Department of Green Technology (IGT), University of Southern Denmark, Odense, Denmark

^e Agrofood Technology Department, Universidad Miguel Hernández de Elche, Orihuela, Spain

^f Department of Public and Non-Profit Management, University of Freiburg, Germany

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ABSTRACT

Purpose: This study, grounded in the Food Choice Questionnaire (FCQ), examined what factors drive Italian Generation Z (Gen Z) to pay for plant-based milk analogues (PBMA).

Design/methodology/approach: 511 Italian Gen Z consumers participated in an online survey. The survey included items from the FCQ and Contingent Valuation (CV) to assess the impact of consumer attitudes and dietary habits on their willingness to pay (WTP) for PBMA. An interval regression analysis was employed.

Findings: The findings indicate that most food choice drivers examined do not motivate Italian Gen Z's WTP for PBMA. Only selling price, dietary habits, perceptions of naturalness, and personal mood significantly influence the participants' WTP.

Originality/Value: Current research sheds new light on Gen Z consumers' motivations for shaping their purchasing intentions towards PBMA, providing valuable insights for the agri-food industry and policymakers.

1. Introduction

Interest in plant-based food and drink is on the rise, with Plant-Based Milk Analogues (PBMA) emerging as the true “*silent king*” of plant-based products in Europe (Nils-Gerrit, 2024). In 2024, the PBMA market across the EU-27 was valued at 3.15 billion euros and is forecasted to grow to 5.63 billion euros by 2029. In 2023, the average consumption of PBMA per capita was three one-litre packs, which is expected to increase to over five packs by 2029. Italy ranked third among the EU-27 members, generating 358 million euros (STATISTA, 2024). This growth reflects the rise of the flexitarian diet, as more people are reducing meat and dairy for various reasons (Clay et al., 2022). Gen Z, which refers to people born in the digital era when smartphones and social media were already common in society (1995–2010), are contemporary food lovers who seek out and purchase the latest products and ingredients mainly for food that brings a “good impression” in the eyes of beholders (Zuo et al., 2022). C. H. Su et al. (2019) pointed out that Gen Z exhibits a keen interest in global food trends and is enthusiastic about exploring

innovative variations or alternatives of conventional food. Thus, it is a key target for plant-based foods due to their preference for alternative dairy, high-quality organic products, and openness to new items.

In the context mentioned above, it is essential to highlight that the PBMA sector is notable because its products are more expensive than traditional dairy milk, which may discourage consumers from buying them (W. Su et al., 2024). Another significant barrier to consumer acceptance of PBMA is its lower sensory appeal than its dairy milk counterpart (Jaeger & Giacalone, 2021). Furthermore, according to Giacalone et al. (2022), health-conscious consumers consider PBMA a suitable dairy milk alternative due to its health benefits. Mohd Zaini et al. (2023) emphasised that PBMA should behave like dairy milk when added to hot drinks, such as coffee, or when used in cooking, thus reflecting the consumers' need for convenience. Moss et al. (2022) identified negative emotions related to some PBMA, likely due to consumers' unfamiliarity with the products. Instead, Haas et al. (2019) identify ethical concerns as key issues in consumer scrutiny of milk production. Furthermore, a significant reason for the rise in PBMA

* Corresponding author.

E-mail address: sergio.rivaroli@unibo.it (S. Rivaroli).

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consumption is the growing global popularity of plant-based diets (Basu et al., 2024a). Studies show that vegans, vegetarians, and flexitarians are more significant PBMA consumers than omnivores.

Recognising that the success of beverage products is tied to specific consumer motivations, this study's research question was: Which motivations of Italian Gen Z are behind their WTP for PBMA? Thus, the present research primarily sought to contribute new knowledge regarding drivers affecting Italian Gen Z's willingness to pay (WTP) for PBMA. By exploring the values and beliefs that drive this consumer cohort towards PBMA, we can uncover key insights valuable in effectively catering to the evolving tastes of a new generation. To explore factors affecting Italian Gen Z's WTP for PBMA, we combined psychometric food choice measures with a contingent valuation framework. Our analysis used an interval regression model with variables like Food Choice Questionnaire (FCQ) scores by Steptoe et al. (1995) and style of diet (e.g., omnivore, flexitarian, vegetarian) (Basu et al., 2024), to examine how motivations affect Italian Gen Z's WTP.

This research advances understanding of consumer behaviour by combining psychometric measures of food choice motivations with stated preference techniques. By integrating the Food Choice Questionnaire (FCQ) with the Contingent Valuation Method (CVM), we illustrate how fundamental motivations such as dietary habits, mood, and natural content influence Italian Gen Z's WTP for PBMA. Although previous research has often studied food choice motives and economic valuation separately, our approach connects these areas and offers a more complete framework for understanding sustainable food consumption. Understanding Gen Z's attitudes and dietary habits towards PBMA enriches literature and provides insights for the agri-food industry to enhance product development, refine marketing strategies, and assist policymakers in promoting healthier plant-based diets.

The remainder of the paper is organised as follows. Section 2 reviews the relevant literature on food choice motivations for PBMA and develops the research hypotheses. Section 3 outlines the research method adopted in this study. Section 4 reports the econometric results, highlighting the role of different food choice motivations in explaining Gen Z's WTP for PBMA. Finally, Section 5 discusses the findings in relation to previous research, while Section 6 concludes and draws some managerial implications.

2. Literature review and hypotheses development

Different approaches to investigating consumers' drink and food choices include the FCQ. Validated across Europe, the FCQ has 36 items across nine dimensions: Health, Mood, Convenience, Sensory Acceptability, Naturalness, Price, Weight Control, Familiarity, and Ethical Concerns. Each dimension features 3 to 6 items rated on a four-point Likert scale, though some studies use comparable point scales, as noted by Dowd and Burke (2013). Based on the existing literature, the motives for Gen Z's WTP for PBMA were analysed in light of the FCQ dimensions, and research hypotheses were formulated. Consumers' attitudes towards PBMA can be assessed via a hypothetical market simulation using a stated preference method. Despite the gap between consumers' intentions and actions noted in the literature (Ajzen et al., 2004), this study used WTP from hypothetical scenarios to estimate consumers' inclination to purchase PBMA instead of measuring the maximum price for one litre of this beverage.

2.1. Sensory acceptability

A significant barrier to consumer acceptance of PBMA is that its lower sensory appeal stems from consumers' expectations based on traditional dairy products (Jaeger & Giacalone, 2021; McClements, 2020). Research has shown that PBMA often falls short in palatability (Alcorta et al., 2021; Jaeger et al., 2024; Jaeger & Giacalone, 2021), primarily due to differences in flavour, mouthfeel, and colour when compared to dairy milk (Cardello et al., 2022; Lipan et al., 2021; Moss

et al., 2022; Vaikma et al., 2021). In response to these challenges, the PBMA industry has sought to enhance palatability and mouthfeel by incorporating ingredients like sugar, salt, stabilisers, and emulsifiers, which can sometimes alter the nutritional profile. Therefore, the following hypothesis is proposed:

Hypothesis (H1). Sensory acceptability positively influences Italian Gen Z consumers' WTP for PBMA.

2.2. Healthiness, weight control and naturalness

A significant issue in the discussion about PBMA is its lack of nutritional equivalents to dairy milk. Clark et al. (2022) noted that many healthcare professionals believe dairy products have higher nutritional value than PBMA. While dairy milk is a key source of macronutrients (carbohydrates, fats, and protein) and contains essential micronutrients (Schuster et al., 2018; Vanga & Raghavan, 2018), it faces scrutiny for potential adverse health effects, particularly for those with allergies (Michaëlsson et al., 2014, 2017; Noreen, 2024; Yvette, 2023). Chollet et al. (2014) found that older Swiss adults think full-fat dairy products contribute to weight gain and high cholesterol. Conversely, Giacalone et al. (2022) state that health-conscious consumers view PBMA as a viable substitute due to its health benefits, such as high polyunsaturated fat content and low saturated fat, potentially lowering cardiovascular disease and obesity risks (Chen et al., 2016). However, due to nutrient deficiencies in PBMA (Mohd Zaini et al., 2023), it is often fortified, leading consumers to view it as less natural and more processed than dairy milk. Therefore, relevant hypotheses are formulated as follows:

Hypothesis (H2). Perception of healthiness positively influences Italian Gen Z consumers' willingness to pay for PBMA.

Hypothesis (H3). Weight control credence positively influences Italian Gen Z consumers' WTP for PBMA.

Hypothesis (H4). The perception of naturalness positively influences Italian Gen Z consumers' WTP for PBMA.

2.3. Convenience

According to de Costa et al. (2007), convenience, which encompasses the time and effort spent buying or using a product, is crucial for food choice. In this study, convenience is defined as the ease of finding a PBMA beverage and its ability to perform similarly to dairy milk in hot drinks, such as coffee, or in cooking, which is related to the physico-chemical properties of PBMA. Mohd Zaini et al. (2023) highlighted the importance of this factor for PBMA's success. Su et al. (2024) found that consumers prioritise purchase convenience, defined by ease of purchasing and incorporating PBMA into daily diets, as a key driver. The authors identify purchase convenience as influenced by venues, distance, and distribution channels. Based on this, we propose the following hypothesis:

Hypothesis (H5). Convenience positively impacts Italian Gen Z consumers' WTP for PBMA.

2.4. Price

The PBMA sector is notable for its higher prices than traditional dairy milk (W. Su et al., 2024). Rombach et al. (2023) find that food curiosity and price inflation drive consumer WTP for PBMA. Similarly, Meixner et al. (2024) note that Gen Z identifies price as a crucial factor in selecting PBMA. Elzerman et al. (2013) also highlight price as a significant barrier to PBMA purchases. Again, Moss et al. (2022) confirm that Canadian consumers are concerned about PBMA's price, sensory properties, and raw materials. Therefore, the following hypothesis was proposed:

Hypothesis (H6). Price negatively impacts Italian Gen Z consumers' WTP for PBMA.

2.5. Emotion and familiarity

Emotional reactions to food significantly impact consumer behaviour and WTP. However, despite the importance of this factor, the emotions raised in consumers by PBMA have not yet been studied extensively (Cardello et al., 2022; McCarthy et al., 2017). Jaeger and Giacalone (2021) noted that PBMA often evokes negative emotions due to the stigma associated with the less appealing early products that the new PBMA products still carry. Supporting Jaeger and Giacalone (2021), Moss et al. (2022) linked negative emotions, particularly with cashew milk, to a lack of consumer familiarity. According to Bateman (2002), given that mood can be considered a more diffuse, longer-lasting, and generally milder emotion, the following hypotheses were formulated:

Hypothesis (H7). Positive mood positively impacts Italian Gen Z consumers' WTP for PBMA.

Hypothesis (H8). Product familiarity positively impacts Italian Gen Z consumers' WTP for PBMA.

2.6. Dietary habits

The growth of PBMA consumption is driven by the rising popularity of plant-based diets, including veganism, vegetarianism, and flexitarianism, where consumers decrease meat intake (Basu et al., 2024; WHO, 2021). The vegetarian diet excludes meat and includes PB foods like cereals, vegetables, fruits, legumes, nuts, and seeds, while vegan diets are stricter, eliminating all animal products. Flexitarian diets favour plants but allow moderate meat and fish consumption. Health benefits largely motivate the shift to vegetarianism and veganism (Fehér et al., 2020). Thus, vegans, vegetarians, and flexitarians are key target groups for PB milk analogue consumers, more so than omnivores. Therefore, the following hypothesis was formulated:

Hypothesis (H9). An omnivorous pattern diet negatively impacts Italian Gen Z consumers' WTP for PBMA.

2.7. Ethical issues

Haas et al. (2019) emphasise that ethical issues significantly affect consumer perceptions of milk production. Beyond environmental concerns, factors such as animal welfare, the suffering of farm animals, and animal rights strongly influence individuals to pursue plant-based diets (Janssen et al., 2016). According to Leary et al. (2023), aligning foods with ethical consumption goals may encourage people to opt for non-dairy plant-based alternatives. Furthermore, research by Halme et al. (2023) and McCarthy et al. (2017) indicates that stopping animal mistreatment significantly encourages the consumption of PBMA. Consequently, we propose the following hypothesis:

Hypothesis (H10). Ethical concerns positively impact Italian Gen Z consumers' WTP for PBMA.

In sum, the research model showing all hypotheses is depicted in Fig. 1.

3. Method

3.1. Data collection

The cover letter provided instructions on completing the survey and outlined the privacy and confidentiality of the collected data. People aged 18+, residents in Italy, who gave informed consent to participate in the study and consumed PBMA at least once per week, were eligible to participate.

Participants were randomly recruited at supermarkets to engage Gen Z PBMA consumers while ensuring gender balance. The survey occurred from January to June 2023. Interviewers asked customers exiting the supermarket, "Do you drink PBMA?". If so, they assessed their willingness to participate in a computer-assisted survey on the spot.

A small group of 30 Gen Z PBMA consumers pre-tested the

questionnaire, which included sections on socio-economic profiles, PBMA consumption frequency, and eating habits. Following De Backer and Hudders (2015), respondents indicated their eating habits using nine alternatives: Full-time meat eater (1), Flexitarian (2), Pollotarian (3), Pescatarian (4), Macrobiotic (5), Lacto-ovo Vegetarian (6), Lacto-Vegetarian (7), Ovo-Vegetarian (8), and Vegan (9). These were grouped into five categories: "Omnivores" (1); "Flexitarians" (2, 3, 5) who primarily eat vegetarian but occasionally include meat, dairy, eggs, and fish; "Pescatarians" (4), excluding meat, poultry, and eggs but including dairy and possibly eggs; "Vegetarians" (6, 7, 8), where diets exclude meat, poultry, seafood, and dairy but allow eggs; and "Vegans" (9), omitting all animal products including meat, dairy, and eggs. The second and third survey sections used item batteries to elicit WTP responses via the Contingent Valuation Method (CVM) and assess consumer attitudes towards PB vegan milk with modified Steptoe et al. (1995) FCQ items (Table 1). (See Figs. 1–3.)

3.2. Procedure

The study used the Double-Bounded Dichotomous Choice CVM method for its efficiency in estimating WTP (Hanemann et al., 1991). Participants completed a modified version of Steptoe et al.'s (1995) FCQ to characterise their attitudes towards PBMA. Despite the gap between

Table 1
Adapted FCQ's structure ($n = 259$).

Factor and Item number	Median
Factor 1—Health	
22. It is enriched with vitamins and minerals	5
29. Keeps me healthy	6
10. Is nutritious	6
27. Is high in protein	6
30. Is good for my skin/teeth/hair/nails, etc.	5
9. Is high in fibre and roughage	5
Factor 2—Mood	
16. Helps me cope with stress	4
34. Helps me to cope with life	4
26. Helps me relax	4
24. It intrigues me in some way ^(a)	5
13. Makes me happy ^(a)	4
31. It helps me keep a fulfilling lifestyle ^(a)	6
Factor 3—Convenience	
1. It can be used in the preparation of other food ^(a)	6
15. It is easy to heat ^(a)	5
28. Does not require to be shaken before use ^(a)	4
35. Can be bought near where I study/live/work ^(a)	6
11. It is easily available in shops and supermarkets	6
Factor 4—Sensory Appeal	
14. Smells nice	6
25. Looks nice	5
18. Leaves a good sensation on the palate ^(a)	6
4. Tastes good	6
Factor 5—Natural Content	
2. Contains no additives	6
5. Contains natural ingredients	6
23. Contains no artificial ingredients	6
Factor 6—Price	
6. It is not expensive	6
36. Is on sale ^(a)	5
12. It is a good value for money	6
Factor 7—Weight Control	
3. Is low in calories	5
17. Helps me control my weight	5
7. Is low in sugar ^(a)	6
Factor 8—Familiarity	
33. Is what I usually consume ^(a)	5
8. Is made with ingredients familiar to me ^(a)	5
21. It tastes the same as the first plant-based milk I tested ^(a)	4
Factor 9—Ethical Concern	
20. Comes from countries I approve of politically	5
32. Has indicated the country of origin of the raw materials used ^(a)	6
19. Is packaged in eco-compatible containers ^(a)	6

Notes. (a) Item modified.

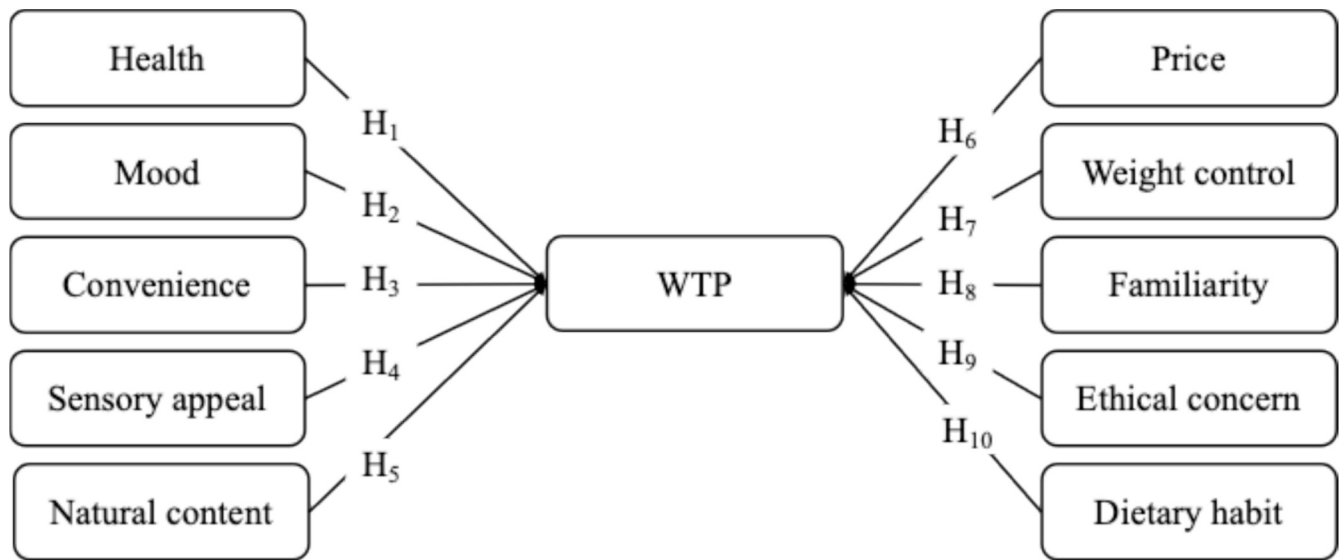


Fig. 1. Proposed research model and hypotheses.

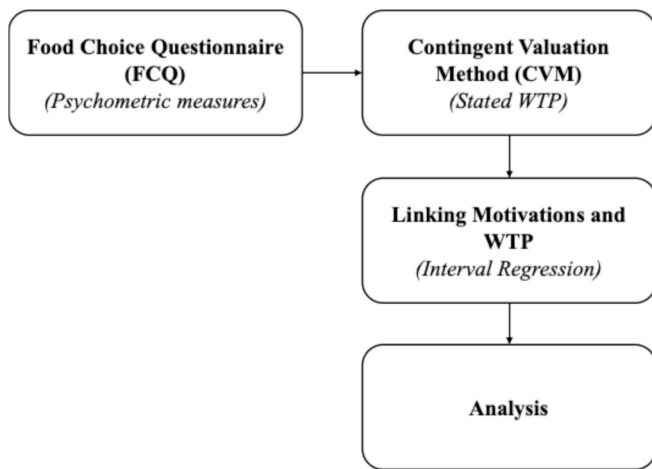


Fig. 2. Study protocol integrating the Food Choice Questionnaire (FCQ) and the Contingent Valuation Method (CVM).

consumer intentions and actions, this study used hypothetical WTP scenarios to assess consumers' inclination to purchase PBMA rather than determine the maximum price for one litre of the beverage. Fig. 2 illustrates the study protocol with the sequential stages of the research design adopted in this research.

3.2.1. Eliciting WTP response

The bidding process included two questions (Q1 and Q2) that established the respondents' WTP limits (Fig. 3). In Q1, participants were asked if they were WTP one litre of their preferred PBMA product at a starting price of P_0 , randomly selected from PBMA's price values of €1.35 to €3.50 based on 2023 STATISTA data, where the average retail price in Italy was €2.21 per litre (Nils-Gerrit, 2024).

A premium price (Q2. "Are you willing to pay P_h ?", where $P_h > P_0$ and $P_h = 1,5 P_0$) or a discounted price (Q2. "Are you willing to pay P_l ?", where $P_l < P_0$) of 50 % of the initial bid was considered for the second bidding process in Q2. In Q1 and Q2, respondents had to indicate "yes" or "no" for each bidding price regarding their intent to purchase. Therefore, participants' responses led to four outcomes: (1) the respondent is not willing to buy one litre of their preferred PBMA at the initial price (P_0) and does not want to buy it even at the discounted price

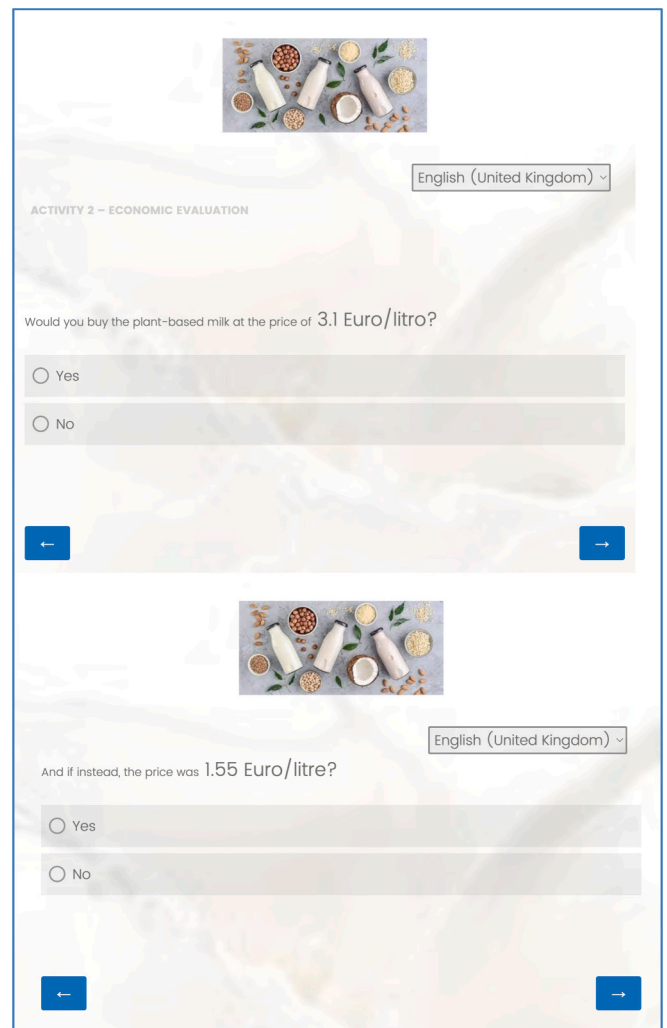


Fig. 3. Example of consecutive price questions during the bidding process.

P_l , where $Pl = (P_0/2)$ (i.e. they say “no” in Q1 followed by “no” in Q2); (2) the respondent is not willing to purchase one litre of their preferred PBMA at the initial price (P_0), but it is willing to purchase it at the follow-up bid (P_l) (i.e. “no” followed by “yes”); (3) the respondent is willing to buy one litre of their preferred PBMA at the initial bidding price (P_0) but is not willing to buy it at the premium price P_h , where $Ph = (P_0 \times 1.5)$ (i.e. “yes” followed by “no”); (4) the respondent is willing to purchase one litre of their preferred PBMA at the initial bidding price (P_0) and is willing to buy it at the follow-up bid P_h (i.e. “yes” followed by “yes”). Thus, the respondent’s WTP for one litre of their preferred PBMA will fit into one of four intervals: $(0, P_l)$, (P_l, P_0) , (P_0, p_H) and $(p_H, +\infty)$, and the discrete outcomes of the bidding process (D) are defined as follows:

$$D = \begin{cases} 1 & WTP \leq P_l & (\text{No} - \text{No responses}) \\ 2 & P_l \leq WTP \leq P_0 & (\text{No} - \text{Yes responses}) \\ 3 & P_0 \leq WTP \leq P_h & (\text{Yes} - \text{No responses}) \\ 4 & P_h \leq WTP & (\text{Yes} - \text{Yes responses}) \end{cases} \quad (1)$$

Thus, the survey data were classified as left-censored for “No-No” responses, right-censored for “Yes-Yes” responses, and interval-censored for “No-Yes” and “Yes-No” responses.

3.2.2. Eliciting WTP determinants

The interviewees filled out a modified version of [Stephoe et al.’s \(1995\)](#) 36-item FCQ to describe their attitudes towards PBMA ([Table 1](#)). FCQ evaluates nine factors influencing customer attitudes: Health, Mood, Convenience, Sensory Acceptability, Naturalness, Price, Weight Control, Familiarity, and Ethical Concerns regarding PBMA. The questions’ motives were evaluated on a seven-point Likert scale, going from 1-Strongly disagree to 7-Strongly agree, and were introduced using the sentence “It is important to me that the PBMA analogue I drink during a typical day...”. Items were randomised to prevent any potential order effects, ensuring the interviewee did not recognise the specific motives for choosing the investigated foods.

3.3. Empirical model and statistical analyses

The CVM is a survey-based method within the stated preference approaches for valuing non-market goods and services ([Bateman, 2002](#); [Kokthi et al., 2021](#)). While the validity of the WTP elicited by the CVM has been questioned because hypothetical responses often overestimate WTP ([Lusk & Schroeder, 2004](#)), recent literature suggests that biases are less significant for low-priced private goods like PBMA ([Murphy et al., 2005](#); [Vecchiato et al., 2021](#)), especially if CVM is adopted as a monetary expression of consumers’ behavioural intention to purchase, and its determinants as well, as in this study. [Ut-tha et al. \(2021\)](#), for example, treat WTP determined using CVM as a proxy for purchase intention towards sustainable coffee for evaluating the impacts of factors under Fishbein and Ajzen’s theory of reasoned action.

In this light, we assumed that each respondent i had a WTP for one litre of their preferred PBMA product (WTP_i^*), which is the latent variable in eq. (2) below:

$$WTP_i^* = \beta X_i + \varepsilon_i \quad (2)$$

where β is a vector of coefficients, X_i is a vector of the WTP determinants (i.e., food choice motives and dietary styles) and the error term ε_i is assumed to have a mean of zero and be normally distributed. Thus, WTP_i^* is unobserved. Still, it remains within the range of the lower bound (L_i) to the upper bound (U_i), consistent with the right-censored and interval-censored data collected. If a respondent has a “Yes-No” response, the probability of the true $WTP \in [P_0, P_h]$ could be represented by eq. 3:

$$Pr(P_0 \leq WTP \leq P_h) \quad (3)$$

whereas if the respondent has a “Yes-Yes” response, the probability of

the true $WTP \in [P_h, \infty]$ is

$$Pr(P_h \leq WTP) \quad (4)$$

The same rule could be applied to the other two WTP values in interval data, referred to as “No-Yes” and “No-No” responses. Since the dependent variable WTP is in the interval and involves (right/left) censored data, the information collected through the double-bounded contingent valuation online survey was analysed employing an interval regression model in STATA 18 via the interval regression command “*intreg*” to estimate the factors influencing the WTP of Italian Gen Z consumers for PBMA. The initial bidding price (P_0) value was incorporated into the empirical model to detect the bias of the anchoring effect, and the category “*Omnivores*” was adopted as a reference for the variable “*Dietary habits*”.

To encompass the dimensions of the PBMA’s WTP determinants, the properties of the revised version of [Stephoe et al.’s \(1995\)](#) FCQ were assessed using the “*validscale*” command. Internal consistency and scalability were evaluated using Cronbach’s α and Loevinger’s H coefficients; the acceptable thresholds were 0.70 for Cronbach’s α and 0.30 for Loevinger’s H . Construct validity was tested using confirmatory factor analysis (CFA) and goodness-of-fit indices, whereas the adequacy of the statistical model was assessed using RMSEA and CFI indexes. An $RMSEA < 0.06$ and a $CFI > 0.90$ are generally considered to indicate that the model is a good fit. The z-scores for each dimension, resulting from the factor analysis of the FCQ that considered only the remaining items, were used in the interval regression analysis alongside the initial bidding price (P_0) to test the anchoring effect and their dietary habits profile. To illustrate the relative importance of the WTP determinants, we apply the Shorrocks-Shapely decomposition of the R-squared obtained after conducting ordinary least squares regression using a WTP midpoint value.

4. Results

A total of 511 Gen Z Italians were contacted, of which 259 (50.7 % Female) were eligible to participate in the survey. The sample accurately reflects the national socio-demographic profile regarding education, occupational status, and gender balance ([Table 2](#)) ([ISTAT, 2025](#)). Dietary habits varied, with omnivores and flexitarians representing the dominant groups, reflecting the current trend among this consumer cohort in Italy ([Beverfood, 2025](#)).

The Cronbach’s α values for the Health (0.71), Mood (0.78), Sensory Appeal (0.70), and Naturalness (0.72) dimensions were deemed

Table 2
Sample description (n = 259).

	N	%
Gender		
Male	125	48.26
Female	134	51.74
Age group (years)		
Min	19	
Max	27	
Median	22	
Education level		
University	108	41.70
High school	141	54.44
Middle School	7	2.70
None	3	1.16
Occupational status		
Employed full-time	68	26.25
Looking for work	16	6.18
Student	175	67.57
Dietary status		
Omnivores	100	38.61
Flexitarians	119	45.95
Pescitarians	7	2.70
Vegetarians	25	9.65
Vegans	8	3.09

acceptable. Four items about Health, Mood, and Convenience were inconsistent with the subscale (Loevinger $H < 0.30$) and were eliminated to enhance the α -coefficient of the dimension ($H_{27}^{Health}=0.28$, $H_{22}^{Health}=0.28$, $H_{31}^{Mood}=0.28$ and $H_{28}^{Convenience}=0.09$, where subscripts refer to the items in Table 1). After removing all other items associated with unreliable constructs, the validation for the dimensions based on the Likert scale responses is presented in Table 3. The RMSEA (0.066) and CFI (0.866) indicate an acceptable fit of this 5-dimensional FCQ model.

Table 4 presents the results of the interval regression analysis. The anchoring effect ($p < 0.01$) suggests respondents based their WTP on the first bid from perceived trustworthy interviewers rather than on ambiguity or limited familiarity. The seven determinants accounted for 26.1 % of the variance in consumers' WTP for PBMA. Of this, 96.84 % was attributed to the following factors that significantly influenced Gen Z consumers' WTP for PBMA: P_0 (% $R^2 = 58.14$ %, $\beta=0.518$, p -value = 0.000), "Dietary habits" (% $R^2 = 20.24$ %, p -value = 0.005), "Natural content" (% $R^2 = 14.15$ %, $\beta= -0.188$, $p = 0.008$), and "Mood" (% $R^2 = 4.31$ %, $\beta=0.106$, $p = 0.096$), respectively. The relative coefficients for the four dietary habit categories referred to the "Omnivore" dietary style were all negative and significant (except for the "Vegan" category), indicating that Gen Z omnivores are generally more willing to pay for one litre of PBMA than other dietary styles. The coefficients for the "Sensory appeal" (% $R^2 = 1.83$ %), "Convenience" (% $R^2 = 0.69$ %), and "Health" (% $R^2 = 0.64$ %) were positive, suggesting a potentially positive relationship with WTP; however, the effect was not statistically significant ($p > 0.1$), indicating that this result should be interpreted cautiously.

5. Discussion

Unexpectedly, no strong link between sensory acceptability and Gen Z's WTP was found. Insufficient evidence supports hypothesis 1, which posits that sensory acceptability could significantly and positively influence consumers' WTP for one litre of PBMA. This suggests that Gen Z may not prioritise sensory aspects or compare PBMA with animal products when purchasing (Cardello et al., 2022; Jaeger & Giacalone, 2021).

While it is conceivable that a positive correlation exists between healthiness as a factor influencing Gen Z consumers' WTP, we have found that this correlation does not exist, thus rejecting hypothesis 2. Contrary to Chen et al. (2016) and Giacalone et al. (2022), the PBMA lacks sufficient appeal for health benefits to justify consumers' decisions to purchase them. Healthiness is not a key driver for PBMA choices, likely because actual decisions often rely more on immediate factors, such as product price. (i.e. P_0 in our study). Contrary to our hypothesis, the perception of naturalness negatively impacts Italian interviewees' WTP for PBMA, thereby rejecting hypothesis 4. This stems from their belief that processed foods, like PBMA, are less natural than animal milk, creating scepticism. This scepticism arises from a lack of knowledge, fostering suspicion and distrust, which leads to a contrasting reaction to

Table 3
Validity and reliability tests on constructed latent dimensions (n = 259).

Factors	Number of items kept	Cronbach's Alpha (≥ 0.7)	Loevinger's H (≥ 0.3)
Factor 1—Health	4	0.71	0.33
Factor 2—Mood	5	0.78	0.37
Factor 3—Convenience	4	0.71	0.36
Factor 4—Sensory Appeal	4	0.70	0.33
Factor 5—Natural Content	3	0.72	0.45
Factor 6—Price ^(a)	3	0.68	0.39
Factor 7—Weight Control ^(a)	3	0.68	0.43
Factor 8—Familiarity ^(a)	3	0.56	0.30
Factor 9—Ethical concern ^(a)	3	0.64	0.38

Notes. ^(a) Excluded factor – values referred to before removing it from the analysis.

Table 4
Determinants of respondents' WTP (interval regression outcomes).

Variables	n = 259		
	β	(SE)	p-value
Factor 1—Health (H₂)	-0.015	0,080	0,854 ^(b)
Factor 2—Mood (H₇)	0.106*	0,064	0,096
Factor 3—Convenience (H₅)	0.006	0,084	0,943
Factor 4—Sensory Appeal (H₁)	0.092	0,078	0,237
Factor 5—Natural Content (H₄)	-0.188***	0,071	0,008
Factor 6—Price ^(b) (H ₆)	–	–	–
Factor 7—Weight Control ^(b) (H ₃)	–	–	–
Factor 8—Familiarity ^(b) (H ₈)	–	–	–
Factor 9—Ethical concern ^(b) (H ₁₀)	–	–	–
Dietary habits (H₉)			0.005
- Omnivore ^(a)	–	–	–
- Flexitarian	-0.228*	0,130	0,079
- Pescitarian	-0.739**	0,359	0,039
- Vegetarian	-0.720***	0,212	0,001
- Vegan	-0.447	0,338	0,186
Anchoring effect (P₀)	0.518***	0,098	0,000
Sigma	0,826	0,050	

Notes. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; ^(a) Reference category; ^(b) Excluded factor.

Legenda. (H) refers to the hypotheses.

product naturalness stimuli. Again, insufficient evidence indicates that convenience perception positively impacts Gen Z consumers' WTP for PBMA. Contrary to what was hypothesised, although research suggests that convenience is a relevant driver in food choices, it was not a significant driver for this sample, thus rejecting hypothesis 5. One possible reason is that consumers who value naturalness and freshness tend to steer clear of convenience foods, despite their time-saving benefits (Vischers et al., 2013).

The exclusion of price as a determinant of food choice indicates that market-driven factors do not significantly influence Gen Z consumers' WTP. Instead, this is a subjective construct shaped by individuals' perceived product value, which is influenced by personal preferences and external cues regarded as reference points for interviews (i.e. P_0 in our study).

As hypothesised (i.e., hypothesis 7), the positive and significant relationship between mood and WTP aligns with the findings of Capra et al. (2010) that mood can effectively influence consumers' WTP. Anyway, we aim to explore this affirmation more in-depth in future research. If confirmed, this suggests that Italians respond to positive marketing triggers, such as mood-enhancing visuals, which prompt them to spend on PBMA by changing their mood.

In contrast to Clay et al.'s (2022) outcomes, flexitarians, pescatarians, and vegetarians are significantly less willing to pay than omnivores for purchasing PBMA. Contrary to our expectation and in line with Hoek et al.'s (2011) considerations, Italian Gen Z omnivores are more open to PBMA due to their flexible diets and desire for variety, thus rejecting hypothesis 9. Unlike our initial theoretical framework, price, weight control, familiarity, and ethical concerns are factors excluded from the analysis for parsimonious reasons, compelling us to neither accept nor reject hypotheses 3, 6, 8 and 10.

6. Conclusions and limitations

The analyses indicate that dietary habits are crucial. Mood and emotion also significantly influence consumers' willingness to purchase and pay for PBMA. The positive and significant anchoring effect on WTP, linked to the absence of a connection between price and WTP, suggests that respondents lack a stable and pre-formed valuation of the PBMA, and their WTP varies with context. This may imply that perceived value and premium positioning shape Italian Gen Z consumers' WTP for PBMA. Hence, tying pricing to high-quality references can enhance the product's perception, strengthening its desirability. The WTP for PBMA

might shift based on the different gastronomic contexts in which the PBMA product is utilised, such as for cooking dishes or during the main meals (e.g. breakfast in addition to the coffee). Consequently, recognising and integrating these elements into effective communication strategies is crucial for the agri-food industries to enhance the value of novel PBMA and assist policymakers in designing measures that promote healthier plant-based diets, attracting a wide range of Gen Z consumers. This pilot study targets Italian consumers. A broader survey could enhance findings on Gen Z's behaviour towards PBMA in Italy. Future research should replicate these findings in other countries to provide context-specific results, including other psychological constructs (such as consciousness towards the environment and health), and to better explore the factors that drive these results Gen Z to pay for PBMA. Furthermore, while CVM offers a valid first approximation of consumer willingness to pay, several complementary approaches can be employed to reduce the influence of cognitive bias (i.e., the anchoring effect). These include incentive-compatible elicitation methods and payment card formats, which can further help in producing more robust and consistent WTP estimates. Although the variance explained by the model is significant in behavioural economics and consumer research, it highlights opportunities for future studies to explore further layers of behavioural complexity.

CRedit authorship contribution statement

Sergio Rivaroli: Writing – original draft, Project administration, Methodology, Formal analysis, Conceptualization. **Cristina Calvo-Porràl:** Writing – original draft, Methodology. **Rachele Ferretti:** Investigation, Data curation. **Davide Giacalone:** Writing – original draft, Conceptualization. **Ángel A. Carbonell-Barrachina:** Investigation, Conceptualization. **Jörg Lindenmeier:** Investigation, Conceptualization.

Ethics statement

This research complied with the local and national guidelines for nonmedical research involving human subjects.

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.

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Data availability

Data will be made available on request.

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