



Exploring the takeout Food Preferences and Interactions with Demographic Characteristics in China: A Discrete Choice Experiment in Chinese Adults

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Abstract

Background: Guidelines for Nutrition Labeling of Catering Foods was published in China in 2021. Takeout food is increasingly prevalent in China, accounted for over 20% in catering industry. It is essential to know how the nutrition quality counts in the decision making and how much extra money the public would like to pay. However, little is known about how nutrition along with other factors influences the decision making in ordering takeout food. The aim of this study was to investigate how those factors affect Chinese consumers in takeout food choice and quantify the interactions between food preferences and demographic and health characteristics.

Methods: Adult participants (n =577) completed online discrete choice experiment (DCE) questionnaires, which consisted of three attributes (taste, nutritional quality, and price).

Results: Taste was found to be the most important attribute, followed by price and nutritional quality. Sufficient taste, nutritional quality information not provided, low nutritional quality (nutrition evaluation score: 40 out of 100), and price were found to have negative impacts on takeout food choices. Compared with a meal with good nutritional quality, marginal willingness to pay (MWTP) for nutrition information not provided was ¥-7.56, which was very close to that of poor nutritional quality (¥ -9.22).

Conclusions: The findings from this study suggested that if the nutritional quality information is provided, respondents were likely to pay more, stressing the importance of providing nutrition information in takeout food in China. Taste was the most important influencing factor on people's choices, followed by nutritional quality and price with almost the same importance. Preferences varied by socio-demographics and health characteristics, suggesting that influencers of takeout food preferences of each group are different and complicated.

Keywords: Takeout Food; Discrete choice experiment; Food preference; Healthy eating; Chinese Adults; Nutritional Quality

Abbreviations: FF: Fast Food; TF: Take-Away Food; O2O: Online-to-Offline; DCEs: Discrete Choice Experiments; BMI: Mass Index; CL: Conditional Logit; SES: Socioeconomic Status

Introduction

With the rapid urbanization and globalization of the food industry during the past decades, China has been experiencing the nutrition transition, which means the traditional diets high in cereals and vegetable transfer to the Western pattern diets high in sugars, fat, and animal-source food [1,2]. Meanwhile, the fast food (FF) industries in China have developed dramatically [3]. For example, KFC opened its first restaurant in 1987, and then it had approximately 9094 restaurants at the end of 2022 in China [4]. The Fast-Food industry generated an estimated \$184.5 billion in

2022, with revenue expected to rise at an annualized 3.6% over the five years through 2022 [5]. In China, take-away food (TF) has been regarded as a significant form of FF [6], owing to acceptable prices, convenience, delivery efficiency and choice diversity. In recent years, the Internet economy has developed sharply with the increased use of the internet and mobile devices. A report showed that mobile Internet users in China grew to 986 million in December 2020 with a proportion of 99.7% China's netizens accessing the Internet via their mobile phones [7]. The developments of on-

line-to-offline (O2O) industry, as a part of the internet economy, growing fast along with the population of food delivery. O2O food delivery customers grew steadily by 22.7%, from 343 million to 468 million which counts for 52.7% in internet users and 21.4% in food service industry [8]. TF consumers in China mainly consist of the 80s and 90s, especially the white-collar workers and college students [6,9,10]. For instance, consumers from 18 to 25 count as the largest part with 36%, the ones from 26 to 30 are 22% while adults from 31 to 35 are 17% in this case [8]. According to a marketing survey, the price of over 36.5% TF is from 10 to 20, 38.1% is from 20 to 29 and 13% is from 30 to 39 [11]. Current research about TF in China focused on food safety, hygiene [12,13], and the potential adverse effects on health [6,14,15]. A study has shown that online food delivery platforms are a new mode of foodborne disease transmission [13]. Due to lack of policies and supervision from government, the standard food preparation awareness is insufficient for some online food companies, which means they could not meet the safety and hygiene standards. Also, research has shown that TF customers should pay attention to the potential harm of PAEs from plastic containers [16].

FF is high in unhealthy fats, salt, and sugar [17], which has negative health consequences, including the related risks of obesity [6,18,14] and elevated BP [18]. The food industry uses sugar, fat, and salt to optimize palatability and can also use those as cheap bulking agents [20]. In fact, higher fat and total energy intakes, as poor dietary patterns, are associated with the consumption of takeout and fast foods which offer a variety of ready-to-eat meals and energy-dense foods [21]. Some studies have demonstrated that sodium intake was associated with cardio-metabolic risk both among adults [22,23] and children [24]. However, most people have not realized the poor nutritional quality of foods consumed while eating out in unhealthy facilities or making unhealthy food choices [25]. To facilitate the consumers to choose and ensure industry to provide a health dish, the Chinese National Health Commission has published the Outline for the Development of Food and Nutrition in China (2021-2035) by solving the imbalance between production and consumption, quality, and nutrition [26]. As a result of that, it is essential to know how nutritional quality counts in the decision making and how much extra money the public would like to pay.

Discrete choice experiments (DCEs) have become an important tool to quantify individual preferences over different hypothetical alternative scenarios. This method is increasingly used to understand the preference in different research fields, such as the food sector [27,28], health economics [29] and transportation [30]. Respondents must choose between two or more alternatives that are specified by systematically altering attribute levels using some experimental design method [31]. Choices made by respondents reveal essential information about the underlying individual's utility which overcomes the limitations of traditional questionnaires for quantitatively ranking factors that influence dietary choices by forcing participants to make trade-offs between

these influences [27]. DCEs are an excellent tool for determining the relative importance of different attributes in food decision making, and for calculating trade-offs between them. Previous DCE research mainly focused on meal preferences among older adults, children, and young adults [27]. Preference for TF food has not been examined quantitatively with DCEs method in China. Taste has been a fundamental determinant of highly palatable foods such as fast food [20]. Factors such as time, transportation, and cost are perceived behavior control elements and had value and were likely to influence the choice to consume fast food [32]. Previous research in China also found the behaviors of Chinese consumers to be influenced by price [33]. Take-away food consumption was found to be associated with gender, age, income, education, and mental effort [6,34]. Developed economies using high levels of salt, fat, and sugar in takeout food [35] but the developing economies such as Southeast Asia also have seen the same global trend [17]. Research has shown that lower-income groups have argued that higher-energy-dense food is cheaper than lower-energy-dense food [36]. With the increasing awareness of nutrition in China, it is essential to understand the related factors in making the decision during purchasing the TF. Behaviors related to takeout food could improve the development of an appropriate educational intervention that would not only increase the awareness towards nutrition, but also modify poor dietary patterns and encourage the consumption of healthy food options. The first aim of this study is to investigate how nutritional factors are associated with the food preference of takeout food. The secondary one was to examine interactions between meal preferences and demographic and health characteristics.

Methods

Study design

The survey was internet-based, using self-report questionnaires. The questionnaire comprised of four parts: 1) DCE design choice sets, to explore stated takeout food preferences in adults in a simulated context; 2) takeout food choices in daily life, to investigate revealed takeout food preferences in adults; 3) health status and physical activity; 4) sociodemographic characteristics. Participants were recruited during May 2021 into the study from social media platform. All participants provided informed consent, and all data were non-identifiable and stored on password-protected computers which protected participant confidentiality.

Discrete choice experiment

The online survey and DCE was suitable for use in TF choice preference due to the age group of TF consumer and the Internet population are highly overlapping in China [10]. Compared with paper-based surveys, the cost of online surveys is lower, and there is no indication that online surveys yield inferior results [37]. In the DCE, respondents were presented with choice sets. Choice sets are made up of several options, which include different attributes and levels. The DCE technique combines consumer theory, experimental design theory and econometric analysis, and ran-

dom utility theory [38]. The combinations of the attributes and their levels provide different alternatives which offer participants the highest utility. In the DCE study, attributes and levels were determined by literature review, and interviews with pilot study respondents (n=5).

Attributes and levels

Random Utility Theory suggested that a consumer’s utility from a product is a function of attributes of the product. Attributes and levels were identified based on literature review [15,32], experts’ consultation, interviews with consumers, and food industry reports. The attributes were further refined through pilot testing where respondents suggested reducing the number of attributes

to 4, otherwise it would be difficult to make choices. As shown in [Table1], attributes and levels were as follows: Taste: Sufficient; Good. Nutritional quality (presented in simulated nutrition evaluation scores): Information not provided; 40 out of 100; 80 out of 100. Price: ¥13; ¥26; ¥39.

Experimental design

The DCE design was developed using D-efficient design, in R software (Version 4.1.0). Those designs were created to reduce the burden of respondents. The final design consisted of 6 choice sets. Each choice set offered respondents 2 TF food options and an opt-out option (Figure 1).

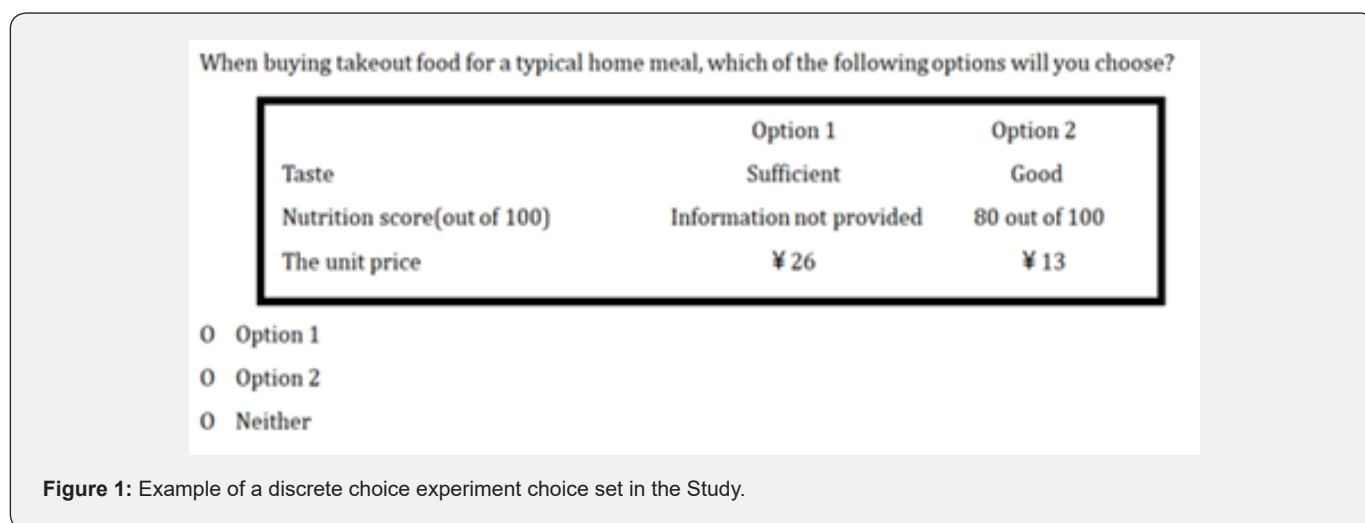


Figure 1: Example of a discrete choice experiment choice set in the Study.

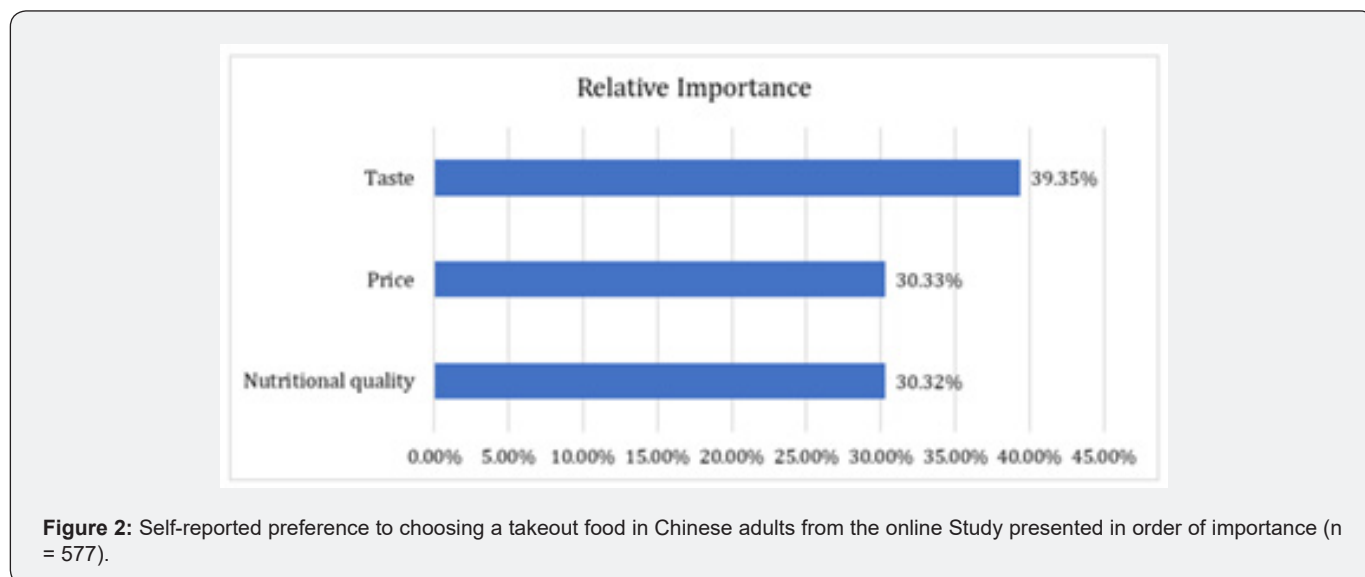


Figure 2: Self-reported preference to choosing a takeout food in Chinese adults from the online Study presented in order of importance (n = 577).

Health knowledge, health behaviors, and sociodemographic characteristics

Self-reported health, Physical activity, Height, Weight, and Knowledge of China’s FBDGS (Chinese balance Dietary pagoda)

were collected in the following sections of the questionnaire [39]. Self-reported health was self-reported as very unhealthy, not very healthy, General, relatively healthy, very healthy. Physical activity was self-reported as Low, Middle, High. Mass index (BMI) was

calculated from weight (Kg) and height (m). Sex, Age, Occupation, Monthly income, and Education were also collected in the survey. Education was recorded into Primary School or Below, Junior high school, High school diploma or equivalent, College degree, bachelor's degree or equivalent. Monthly income was recoded as

Below ¥2000, ¥2000-5000, ¥5000-10000, ¥10000-20000, Over ¥20000. The occupation was categorized as Staff of government institutions, Company employees, Individual businesses, Manual workers, Students, Retirees, Unemployed and unemployed, Others.

Table 1: Meal attribute definitions provided to participants in the online survey.

Attributes	Levels
Taste	Sufficient
	Good
Nutritional quality	Information not provided
	Nutrition evaluation score: 40 out of 100
	Nutrition evaluation score: 80 out of 100
Price	¥ 13
	¥ 26
	¥ 39

Participants

Sample size calculation for DCE studies in food preferences is a developing field, previous studies suggested that the minimum sample size of n = 100 could be sufficient to provide the preference data and a reliable model [40]. Orme recommended sample sizes of at least 300 and Marshall et al. reported that nearly 40% of the sample sizes were in the range of 100 to 300 respondents. In this study, a total of 577 adults completed the survey by using a questionnaire on WeChat, the largest chat app in China connecting over 1 billion people. The selected WeChat groups mainly contain the college students and white-collar workers from 18 to 35 which covers about 75% of TF users. The following inclusion criteria were used: 1) aged over 18 years; 2) living in China; 3) have purchased take-out food.

Online procedures

The online survey and DCE were delivered via WJX website (www.wjx.cn), which is an online crowdsourcing platform in mainland China. Individuals open the survey via a study-specific link created by WJX on the social media platform. The online questionnaire informed potential participants of the aim of the study, the risk and benefits, and how personal confidentiality would be protected. Interested individuals were informed that participation was entirely voluntary, and they could quit the survey at any time. In addition, individuals who completed the survey would receive an incentive as a reward. This survey was open for 1 week, which would ensure enough individuals to participate in the survey.

Statistical analyses

Part-worth utilities in the DCE for product attribute levels were estimated using conditional logit (CL) model based on random utility theory [41]. CL model assumes that individual choices between alternatives are utilities of the relevant features of product alternatives. Data were analyzed via R (Version 4.1.0). Con-

sidering that some data were ordinal, and some were continuous, data were recoded into binary variables to ensure consistency of interpreting interaction analyses. Cut points were selected based on sample sizes of binary levels and comparability with DCE attribute levels: age (<25 vs. ≥25); physical activities (<2.5 vs. ≥2.5); sex (male vs. female); weekly take out frequency (less than once a week vs. 1 to 3 times a week, 4 to 6 times a week and more than 7 times a week); average price of takeout meal (¥ 0 to 10, ¥ 11 to 20 and ¥ 21 to 30 vs. ¥31 to 40 and more than ¥ 41); take-away food taste (poor and sufficient vs. good); nutritional quality of takeout (Not very nutritious, general and I do not know vs. more nutrition); Overall diet health (poor and fair vs. good, very good and excellent); knowledge of China's FBDGS (I don't know vs. I know); self-reported health (poor, fair and good vs. very good and excellent); BMI was recoded into not-overweight group (BMI <23) and overweight or obese group (BMI ≥23); Education was recoded into low (primary school or below, junior middle school or equivalent, high middle school or equivalent) or high (University degree or equivalent, higher University degree); monthly income was recoded into low (Below ¥ 2000, ¥ 2000-5000 or ¥ 5000-10000) or high (¥ 10000-20000 or over ¥ 20000).

Results

In this study, a total of 713 questionnaires were collected and 136 questionnaires were excluded. Finally, 577 questionnaires were eligible. As shown in Table 2, respondents remarkably held the college degree or bachelor's degree category (47.7%), were a company employee (31.9%), consistent with the characteristics of most of the TF users. Most of respondents were likely to order TF less than once a week (43.8%), with the price between ¥21-30 (43.3%), sufficient taste (57.0%) and moderate nutritional quality (55.3%). respondents self-reported the mean BMI of 23.1 (SD 5.0), the mean age of 30.9 (SD 9.3). 57.5 percent of participants were female, and the majority knew China's FBDGS (60.5%), gen-

eral physical health (41.2%) and had fair diet health (55.3%).

Socio-demographic characteristics and health behaviors

(Table 2)

Stated preferences

As shown in Table 3, Taste, nutritional quality, and price significantly influenced takeout meal choices. Sufficient taste, nutritional quality information not provided, low nutritional quality

(40 out of 100), and price were found to have negative impacts on TF choices.

Relative importance

The online questionnaire collected personal information on the important influences on TF preferences. Relative importance revealed that taste was the most important attribute (39.35%) for takeout choices, and followed by price (30.33%), and nutritional quality (30.32%) (Table 3) (Figure 2).

Table 2: Demographic characteristics and dietary and health related behaviors of Chinese included in the study (n=577).

Characteristic	N	(%)
Weekly takeout frequency		
Less than once a week	253	(43.8)
1-3 times a week	209	(36.2)
4-6 times a week	88	(15.3)
More than 7 times a week	27	(4.7)
Average price of takeout meal		
¥ 0-10	7	(1.2)
¥ 11-20	148	(25.6)
¥ 21-30	250	(43.3)
¥ 31-40	98	(17.0)
Over ¥ 41	74	(12.8)
Takeout food taste		
Not good	19	(3.3)
Sufficient	329	(57.0)
Good	229	(39.7)
Nutritional quality of takeout		
Not very nutritious	101	(17.5)
General	319	(55.3)
More nutrition	109	(18.9)
I don't know	48	(8.3)
Overall diet health		
Poor	55	(9.5)
Fair	319	(55.3)
Good	157	(27.2)
Very Good	38	(6.6)
Excellent	8	(1.4)
Knowledge of China's FBDGS		
I don't know	228	(39.5)
I know	349	(60.5)
Self-reported health		
Poor	9	(1.6)
Fair	75	(13.0)
Good	238	(41.2)
Very good	236	(40.9)

Excellent	19	(3.3)
Physical activity (hours per week), Mean ± SD		
Low	3.6±3.2	
Middle	1.7±2.1	
High	1.3±2.2	
Height, Mean ± SD	167.0±8.0	
Weight, Mean ± SD	64.7±16.2	
Sex		
Male	245	42.5
Female	332	57.5
Age, Mean ± SD	30.9±9.3	
Education		
Primary School or Below	2	(0.3)
Junior high school	17	(2.9)
High school diploma or equivalent	47	(8.1)
College degree, bachelor's degree or equivalent	275	(47.7)
Master's degree or above	236	(40.9)
Occupation		
Staff of government institutions	116	(20.1)
Company employees	184	(31.9)
Individual businesses	23	(4.0)
Manual workers	10	(1.7)
Students	169	(29.3)
Retirees	8	(1.4)
Unemployed and unemployed	10	-1.7
Others	57	-9.9
Monthly income		
Below ¥ 2000	109	(18.9)
¥ 2000-5000	128	(22.2)
¥ 5000-10000	129	(22.4)
¥ 10000-20000	124	(21.5)
Over ¥ 20000	87	(15.1)
BMI, Mean ± SD	23.1±5.0	

Table 3: Stated preferences weights for attributes of a typical weekday takeout meal in the CHOICE Study (n = 577).

Attributes	Levels	Coefficient	SE	p-value	Relative importance score
Taste	Sufficient	-0.55	0.0823	p<0.001	1
	Good	0.55	(Reference level)		
Nutritional quality	Information not provided	-0.25	0.0368	p <0.001	3
	40 out of 100	-0.3	0.0295	p <0.001	
	80 out of 100	0.55	(Reference level)		
Price (per ¥1 per person)		-0.03	0.0026	p <0.001	2

MWTP (marginal willingness to pay)

Table 4: The marginal willingness to pay with different attribute levels in Chinese participants from online study.

Attributes	Levels	WMTP (95% CI)
Taste	Sufficient	-16.86 (-20.72, -13.89)
	Good	
Nutritional quality	Information not provided	-7.56 (-10.34, -5.18)
	Information provided: 40 out of 100	-9.22 (-11.45, -7.31)
	Information provided: 80 out of 100	

Table 4 presents the marginal willingness to pay (MWTP) results. On average, respondents were most sensitive to change in taste. Participants would likely pay ¥16.86 more if the meal tasted good. Furthermore, comparing to a meal with good nutritional quality (80 out of 100), respondents were likely to pay ¥7.56 less if the nutrition information was not provided, and ¥ 9.22 less if the information showed the meal had poor nutritional quality (40 out of 100).

Interactions between attributes and characters

Table 5-7 show the interactions between attributes and demographics and health characteristics. Participants' stated preferences were found to be consistent with their revealed preferences. Respondents who usually order takeout with better nutritional quality, showed their dislike of low nutritional quality; and respondents who usually order takeout with higher price are more likely to choose takeout with higher price.

Table 5: Interactions between stated preferences for attributes and sex, age, education, and monthly income for takeout meals (n=577).

Attributes	Levels	Sex		Age		Education		Monthly income	
		Coefficients	SE	Coefficients	SE	Coefficients	SE	Coefficients	SE
Taste	Sufficient	-0.34*	0.16	0.01	0.02	0.36	0.37	-0.11	0.15
	Good (ref)								
Nutritional quality	Information not provided	-0.18	0.18	0	0.02	-0.97**	0.37	-0.02	0.17
	40 out of 100	0.03	0.14	-0.01	0.02	-0.29	0.31	0.01	0.13
	80 out of 100 (ref)								
Price		-0.02**	0.01	0.00	0.00	0.00	0.02	-0.01	0.01

Table 6: Interactions between stated preferences for attributes and revealed preferences for takeout meals (n=577).

Attributes	Levels	Weekly take out frequency		Price of takeout		Takeout food taste		Nutritional quality of takeout	
		Coefficients	SE	Coefficients	SE	Coefficients	SE	Coefficients	SE
Taste	Sufficient	-0.14	0.15	-0.01	0.04	-0.25	0.16	0.34	0.18
	Good (ref)								
Nutritional quality	Information not provided	-0.03	0.18	0.01	0.05	0.23	0.18	-0.39	0.22
	40 out of 100	0.01	0.14	-0.06	0.04	0.08	0.14	-0.39*	0.17
	80 out of 100 (ref)								
Price		0.00	0.01	0.01*	0.00	-0.01	0.00	0.00	0.01

Table 7: Interactions between stated preferences for attributes and health knowledge and health behaviors for takeout meals (n=577).

Attributes	Levels	Nutritional quality of overall diet		Knowledge of China's FBDGS		Self-reported health		Physical activities	
		Coefficients	SE	Coefficients	SE	Coefficients	SE	Coefficients	SE
Taste	Sufficient	-0.16	0.18	-0.21	0.15	0.53***	0.16	-0.07	0.14
	Good (ref)								
Nutritional quality	Information not provided	-0.06	0.21	0.28	0.17	-0.25	0.19	-0.04	0.16
	40 out of 100	0.02	0.16	-0.04	0.13	-0.45**	0.14	0.12	0.13
	80 out of 100 (ref)								
Price		0.00	0.01	-0.01	0.01	-0.01	0.01	0.00	0.00

Participants who had higher education level preferred to choose TF with higher nutritional quality. Respondents in the health group (self-rated their health as very good and excellent) were more likely to choose takeout with sufficient taste, and less likely to choose takeout with low nutritional quality. Female respondents were less likely to choose takeout with sufficient taste or higher price. Finally, there was little evidence of interactions of takeout attributes with nutritional quality of overall diet, knowledge of China's FBDGS, physical activities, age, and income.

Discussion

This is the first study that employed a DCE approach to value different factors that influence takeout meal choices, and to investigate the relative importance and marginal willingness to pay of nutritional quality for takeout meal choices compared with other factors. Taste was found to be the most important influencing factor, followed by price and nutritional quality information. The positive effect of nutrient and taste, and negative effect of price found in this study were consistent with previous study [42,43]. Price was a more important attribute among those in the lowest socioeconomic status (SES) group compared with those in the higher SES groups [44]. Students preferred quick and cheap snacks, but higher prices on healthy snacks did not affect their decision significantly [45]. In this study, the relative importance ratio of price and nutritional quality was the same, which means those two attributes were same important during individuals' takeout food choice. Nutritional quality was identified as an important determinant of food decisions by many studies [27,46], and results from a study on food choices among older adults showed that nutritional quality of food could be 4.5 times as important as taste, the second most important determinant [46]. This study, however, found that taste was the most important influence on takeout meal choices in Chinese TF users. On average, respondents were willing to pay ¥16.86 more if the taste of meal was good, which was almost half of the average takeout meal prices. It should be

noted that though most important, taste was not the dominant factor. The relative importance of nutritional quality and price were 30.3%, which was not a striking difference compared with that of the taste.

One of the important findings from study was that not providing nutritional quality information for takeout meal had a strong negative impact on food choices, and the impact was almost as strong as bad nutritional quality (Coefficient: -0.25 vs -0.30, MWTP: ¥ -7.52 vs ¥-9.52). Choice sets in previous studies only included different levels of nutritional quality. However, this could not reflect the real situation in China. China Healthy Diet Index (CHDI, a measurement to evaluate the diet quality for adults in China) has not been applied yet, and few food businesses provide nutritional quality information to customers [47]. To predict real-world takeout meal decisions, this study concluded "not providing nutritional quality information" as an attribute level, which mimicked a real-life context. The findings suggested that if the nutritional quality information is provided, respondents were likely to pay more, compared with a meal not providing information of nutritional quality. This stresses the importance of providing nutritional quality information and gives confidence to policy makers and food businesses to advocate the use of nutritional quality information. Also, the finding suggests a new and cost-effective strategy for policy makers. By only making TF food with good nutritional quality provide nutrition information, TF food not providing nutrition information would be valued less by consumers, and thus food industry would be forced to provide information and prove the food nutritional quality. This assumed to have positive impact on the execution of Guidelines for Nutrition Labeling of Catering Foods published by the Chinese National Health Commission in 2021. The mean utility (-0.3) and MWTP (¥-9.22) of bad nutritional quality (Nutritional quality: 40 out of 80) suggests it has a strong negative impact on meal choices, and it was stronger than "nutritional quality information not provided" (-0.25, ¥ -7.56). This could partly explain why food businesses currently

seldom label their meals with nutrient information. Considering takeout meals in China are generally unhealthy [47], providing nutritional quality information would decrease willingness to pay. But this could also be seen as a challenge and an opportunity. Advocacy of using nutritional quality information would urge the food business to try to develop healthier recipes and provide healthier takeout meals, which would finally contribute to population health.

Consistent with previous research, respondents from high educational level group were less likely to choose takeout with low nutritional quality [27,46]. This may be because the higher educational group had more knowledge of nutrition and were aware of the importance of nutrition [48]. In addition, the present study showed that female was less likely to accept higher price for takeout food, compared with male. This is consistent with a previous study, which also found that females had a lower preference for higher cost meals than males [27]. Though, previous studies suggest that female prefer to choose higher quality takeout food [49]. To some extent, higher price does not represent better nutritional quality.

Finally, a few studies investigated the interactions between attributes with self-reported health. Participants who had higher self-reported health scores, were more likely to choose meals with sufficient taste, but less likely to choose takeout food with low nutritional quality. The strengths of this study are the use of DCE method and relatively large sample size. Also, this study recruited sufficient overweight and obese respondents. According to the report Chinese Nutrition Society in 2021, there is more than half of population in China were overweight or obese [47]. There are limitations in this study. Most of previous studies included 4-6 attributes [27,45,46], and this study only included 3 attributes. This was to ensure the data quality, as the pilot study respondents reported cognitive fatigue over 4 attributes and altogether 12 levels and suggested that reducing attributes to 3 may allow them to make sensible choices and reflect their true preferences. Future research is recommended to extend this research by conducting DCE study investigate the influences of nutritional quality on other types of food and beverage. Also, researchers could explore the values of more nutrition and food related attributes, including delivery time food packaging and the rankings of food delivery business. Furthermore, specific groups of people, such as teenagers, patients with chronic diseases, and other vulnerable groups, can be investigated.

Conclusion

Taste was the most important influencing factor on people's choices, followed by nutritional quality and price with almost the same importance. Compared to eating food with information indicating good nutritional quality, customers believed that they lose a lot of utility by eating healthy takeout food and would like to pay much less. This dislike towards no nutritional quality information

was almost as strong as bad nutritional quality. Policy makers and food business are therefore recommended to advocate and promote the labeling of nutritional quality information in takeout food. Preferences towards taste, nutritional quality information, and price of takeout food varied by socio-demographics and health characteristics, suggesting that influencers of takeout food preferences of each group are different and complicated. There should be different health promotion strategies for each group.

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