

## Research Article

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# Food determinants and motivation factors impact on consumer behavior in Lebanon

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**Abstract:** The current study looks at a variety of factors that affect eating patterns. This is about internal and external aspects that lead to a thorough assessment of consumer behavior, with an emphasis on driving forces and obstacles that significantly affect each consumer's food preferences. The information is based on questionnaire research of traditional and fiber food consumption as well as specific consumer purchasing behaviors. The results of the questionnaire survey were analyzed using qualitative aspects analysis and other statistical methods (ANOVA, *t*-test). The study's goal is to provide comprehensive strategies that encourage and support the intake of nutritious meals, especially in light of how different food motivations and knowledge factors influence Lebanese consumer behavior. Based on the findings, individual eating motivation and its impact on consumers' behavior in Lebanon when making food purchase decisions were found. Sources of potential influences include information, the social environment, and environmental variables. Processes like social learning influence the interplay between these components as well as food choices and eating habits. As a result, future programs to encourage healthy eating habits might profit by putting more of an emphasis on learning principles and food preferences when programs are implemented.

**Keywords:** food information, sociodemographic differences, Lebanese consumers, ANOVA

## 1 Introduction

Numerous studies have been carried out on the effects of social and cultural factors on eating habits in different populations [1]. There is strong evidence that the kind, quantity, and intake of food are significantly influenced by social norms [2]. A balanced diet can improve dietary practices and overall population health. The scientific literature has used a variety of variables to study consumer behavior in the food market, with sociodemographic characteristics, motives and attitudes, religious characteristics, cultural and social background, regional variability, and lifestyle being the most frequently used ones [3,4].

Unfortunately, the majority of customers are either uninformed of or uninterested in reading food labels, depending on their social and cultural backgrounds [5]. Many questions about what people believe about healthy eating remain unresolved. Although customers' main objective is to satisfy the demand for basic food commodities, their conduct nowadays is different [6]. The way that modern consumers act toward food has been impacted by changes in their socioeconomic priorities.

Education and emotional eating both significantly influence the choice of food products [7]. Like many other nations, Lebanon encourages healthy eating practices. To do this, it is important to investigate and create socio-demographic, cultural, economic, emotional, and environmental factors as well as some distinct characteristics that motivate healthy eating [8].

This knowledge gap must be filled in order to develop comprehensive methods that support and reinforce the consumption of healthy foods, particularly with regard to how various aspects of food motivation and knowledge affect consumer behavior.

This study sought to evaluate Lebanese people's motivations for healthy eating as well as demographic information and elements related to eating habits as a first step in creating health policies and techniques to encourage nutritional behavior. This groundbreaking study from Lebanon is a component of a global effort named "Psycho-social reasons

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associated with food choices and eating behaviors (EATMOT).”

In the current study, two research questions were addressed:

RQ1: what are the sociodemographic factors that could influence eating motivations in Lebanon? Do age, gender, living environment, level of studies, responsibility in buying food, civil status, and current employment affect eating motivation?

RQ2: what is the impact of motivation food factors and sociodemographic on consumer behavior model?

The article is organized as follows: The theoretical background (Section 2) is followed by the explanation of the methods and materials used in Section 3; Section 4 presents the research findings. The results of the study, its theoretical and practical implications, and potential directions for future research will be covered by the authors in Sections 5 and 6.

## 2 Theoretical background

Local government policy has recently concentrated on acknowledging the potential advantages of traditional and regional food systems and encouraging local food [9]. Despite the enthusiasm of consumers, producers, and policymakers for the benefits of locally grown and traditionally prepared foods, marketing systems continue to outperform labor force survey in terms of economies of scale, profit agglomeration, and negotiating power [10].

The consumer’s preference for local foods and their perceptions about the origin of the food items they eat have been reported by Feldmann and Hamm [11] in their published review. The Alphabet Theory is a newly developed theoretical framework aimed at representing the relations and attitudes of consumers towards alternative food choices. It has been reported that in the last two decades there has been a great boom in the consumer’s interest for local foods, which has led to a corresponding increase in the investigations focusing on consumers’ attitudes and purchase behavior concerning the local foods. Research has demonstrated that people believe that local foods are not expensive and are willing to buy them, even if they are a little more expensive compared to their non-local equivalents, because they perceive other values in local foods.

The review by Monaco and Bonetto [12] highlights the research works that have been focusing on the social representations of food, which have been highly studied and reported in the scientific literature. In fact, besides the individual’s relations with food, there are also very

relevant social and group determinants of food consumption. The social representations encompass structured sets of ideas, opinions, knowledge, and beliefs about food which are shared among a group of people, constituting a social group. For that reason, to investigate these relations and even explore how they vary according to social influences, or even countries, is essential to understand the eating motivations. According to the authors [12], food social representations and culture can be investigated from three perspectives: (a) focusing on the role that social representations have in the construction of connotations attached to food and their incorporation into the thinking frameworks, either individual or group, shaping the role of culture to the representations; (b) addressing the way by which the charring of social representations can allow the identification with and the sense of belonging to a certain group; and (c) looking at social representations as determinants and predictors of consumer behavior.

The Theory of Planned Behavior is one of the tools that uses social–psychological–attitude models to express relationships between attitudes and behavior [13]. This can be further enhanced by adding measures of moral concern, which have been proven relevant for some food consumption decisions.

With respect to social customs and culture, Lebanon is a multiracial nation home to a wide variety of religions and worldviews. Each ethnicity and religion also have its own set of social customs and dietary habits. Hoek et al. [14] found that a person’s religious beliefs affected their attitudes about and behavior as consumers when it came to food preferences, food purchasing decisions, and eating routines. Muslim customers expect wholesome, premium goods that also adhere to Shariah requirements, just like any other kind of customer [15]. Without a doubt, religion has a big role on the cuisine of many nations. With the exception of Christianity, which has no such prohibitions, certain religions exclude specific foods, such as pork and meat that has not been ritually sacrificed in Judaism and Islam. According to estimates, just 16% of Jews, 75% of Muslims, and 90% of Buddhists and Hindus in the United States faithfully follow their religious dietary rules [16].

The way demographics, attitudes, and incentives affect how people purchase food has been investigated. Numerous studies have stressed the importance of the social aspect of consumer behavior and the need for consumers to satisfy both psychosocial and utilitarian needs [17,18]. Since price, convenience, and quality are still important factors in economic motivation, consumer motivations are not necessarily unique in this environment [19], but a social component might be important.

The current study's goal is to fill the aforementioned research gaps by first examining Lebanese people's motivations for healthy eating in relation to food, and then looking at how demographic data (such as living conditions, gender, educational attainment, and age groups), elements related to eating habits, and consumer acceptance can affect consumers' purchase intentions. Our ultimate objective pertains to purchase intention of nutritious food in developing health policies and methods to promote dietary behavior.

Individual food patterns are influenced by a great diversity of social, psychological, sensory, and economic factors [20], as described by a number of theoretical models. The environmental determinants of diet are considerably variable across regions or countries [20–25]. Also the age or sex have been pointed out in many investigations as greatly determining food choices [26–29], with preferences variable according to their own perceptions of any common food item.

## 3 Materials and methods

### 3.1 Instrument

For the purpose of this research, the questionnaire used was structured in ten different parts englobing 84 questions as previously reported [30]. The questionnaire included 55 statements related to eating habits and the choice of a certain food, which were compiled according to different motivations. These types of motivations were chosen because many different studies somehow have indicated that eating habits and/or food choices are dependable on factors such as the ones investigated through this questionnaire, which was developed and validated at first on a sample of Portuguese people [3] and then was extended into other countries. A five-point Likert scale was used to measure the participants' opinions regarding the different types of motivations: 1 (totally disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), and 5 (strongly agree). For the purpose of this study the variables of Parts III to X were carefully examined, tested, and studied.

### 3.2 Data collection

This descriptive cross-sectional study involved 410 people who lived in Lebanon and was conducted using a non-probabilistic sample. The questionnaires were distributed

on social media and submitted online using a Google Forms link. In order to gather the data, a period of time from November 2019 to March 2020 was used. Ethics-related questions and restrictions on the questionnaire were checked before the Ethical Committee gave its approval with reference number 2020-89 (USJ).

### 3.3 Statistical analysis

Basic descriptive statistical tools were used to do an exploratory study of the data. IBM SPSS Statistics version 20 was used for statistical processing, while Microsoft Excel 2013 was used for data centralization (IBM Corp., Armonk, NY, USA).

To investigate the relationships between the following variables, it was essential to determine the average of the results from Parts III to X replies.

- Various sociodemographic factors, as well as reasons for healthy eating vs perceptions of a good diet.
- The difference between the motivation for a healthy diet and the various environmental, political, social, and cultural factors.

As previously mentioned, the items were coded on a Likert scale ranging from 1 (completely disagree) to 5 (strongly agree). An average score for each measurement variable for each participant was derived using the scores for the various items. The scale for motivations ranged from 1 to 5, with numbers under 3 representing “no influence” and those over 3 representing “influence.” The authors conducted a reliability analysis using Cronbach's alpha for the data in the Lebanese sample for the three food motivation variables as well as the dependent variable, despite the questionnaire having previously undergone validation.

When there were two or more groups to compare, the Student's *t*-test for independent samples was used to compare the mean values for each group. When there were three or more groups to compare, the analysis of variance (ANOVA) method was used. The requirements were validated, including the distribution's normality, making the application of parametric tests conceivable. Additionally, the Pearson correlation coefficients were computed in order to assess the relationships between some study variables. The level of significance taken into account was 5% for all statistical analyses ( $p < 0.05$ ).

The study included 410 Lebanese from diverse regions of the country, making it nationally representative. Only people who completed the entire questionnaire and were

at least 18 years old were included. Two sets of questions were posed to the participants: the first set concerned demographic information, anthropometric information, and behavior and health-related aspects; the second set addressed reasons for adopting a healthy diet.

Depending on the distribution of the variables, we employed the Student's *t*-test to compare continuous variables between groups (normal or non-Gaussian distribution) and the Pearson test for correlations. The ANOVA test for Gaussian distributions is used to compute the mean difference between several continuous variables [31].

## 4 Results

### 4.1 Sample characterization

The demographical data for the sample studied are summarized in Figures 1 and 2, highlighting the highest percentages for each demographical variable. There were 410 people who participated in the poll, and of those, 74.1% were female and 25.9% were male. The age range of the participants was from 18 to 72 years, with a median

age of 37. They were divided into four age groups: young adults (18–30 years old), which made up 32.4%; average adults (31–50 years old), which made up 57.3%; senior adults (51–64 years old), which made up 8.3%; and finally, the elderly (more than 65 years old), which made up 2% of the sample. A significant portion of the participants – nearly 95% – had a university degree. The participants' marital status was as follows: 40% were single, 56.8% were married or cohabiting, 2.7% were divorced or separated, and 0.5% were widowed. Regarding the participants' living situations, 30% of them resided in urban areas, 15.1% in rural areas, and 54.9% in suburban areas (Figure 1). Regarding the current professional activity, most participants (68%) were employed. The remaining participants (13.2%) were students, 2.7% were working students, 14.4% were unemployed, and 1.7% were retirees. Another inquiry concerned the participant's professional endeavors or academic pursuits, particularly those pertaining to certain sectors, such as food, nutrition, agriculture, sports, psychology, or other health-related pursuits. Regarding this, 70.2% of respondents indicated that none of the aforementioned professional fields applied to them (Figure 2). Finally, 75.1% of participants were found to be in charge of making their own food purchases.

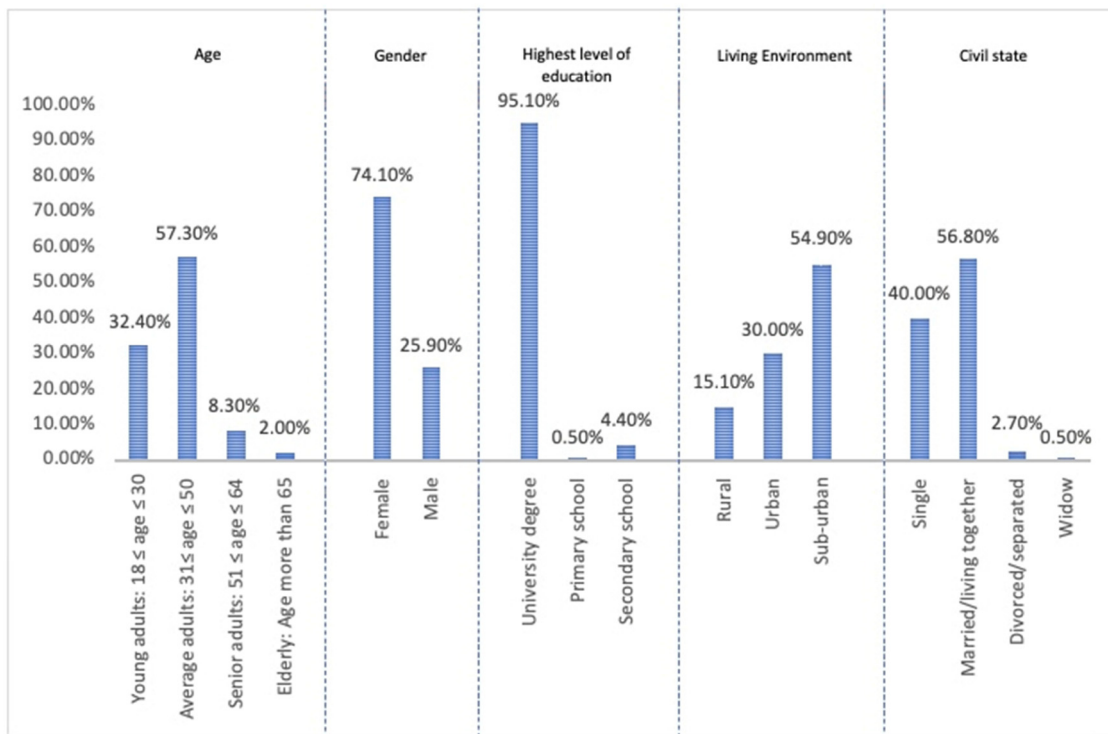


Figure 1: Demographical data: age, gender, highest level of education, living environment, civil state.

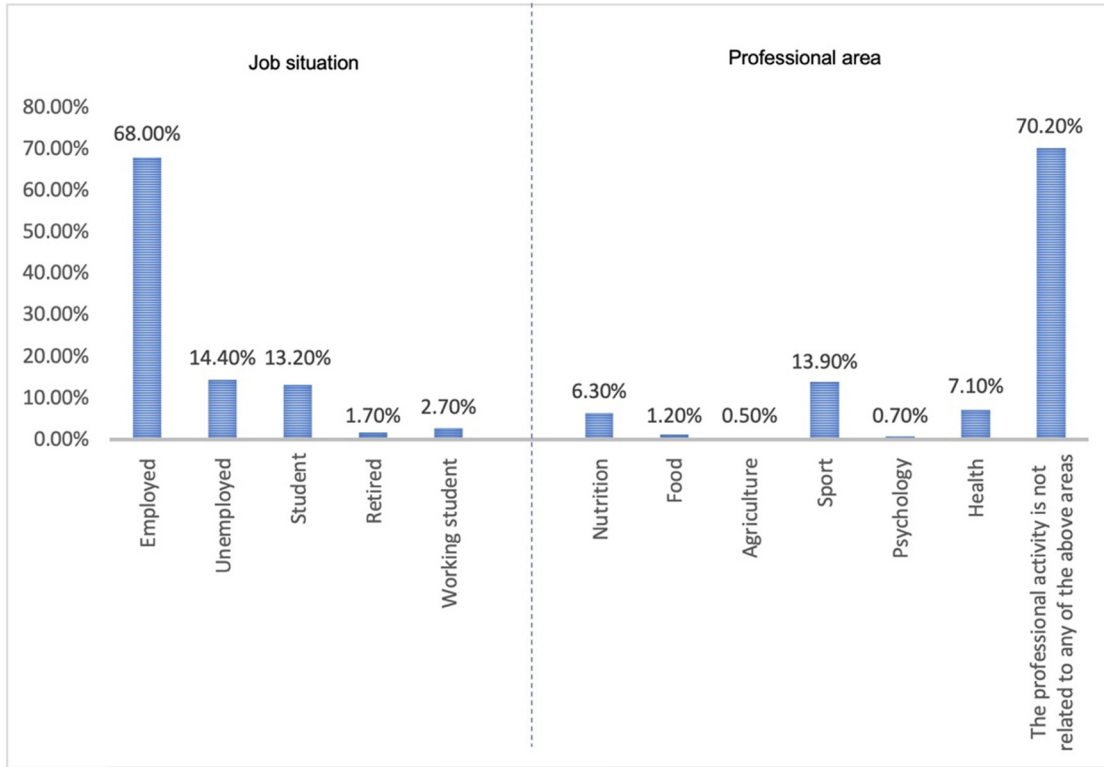


Figure 2: Demographical data: job situation, professional area.

Table 1: T-test for gender and responsibility in buying food results

Food motivations	Gender	N	Mean	Std. deviation	F	Sig.	t	df																																																												
Healthy motivation	Male	106	3.4623	0.61990	0.266	0.606	-2.474	408																																																												
	Female	304	3.6414	0.64975					Emotional motivation	Male	106	3.05	1.008	1.589	0.208	-3.332	408	Female	304	3.42	0.978	Economic and availability motivation	Male	106	2.98	0.676	26.632	0.000	1.796	238.074	Female	304	2.83	0.883	Environmental and political motivation	Male	106	3.43	0.840	0.072	0.789	0.921	408	Female	304	3.35	0.815	Social and cultural motivation	Male	106	3.09	0.737	3.405	0.066	2.211	408	Female	304	2.90	0.804	Marketing and commercial motivation	Male	106	3.17	0.810	0.004	0.947	-1.667
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### 4.2 Results for research question one

In order to respond to RQ1 and investigate the possibility that sociodemographic characteristics in Lebanon might have an impact on people’s motivations for eating. ANOVA and student *t*-tests were run.

H0: There are no sociodemographic differences influencing eating motivations in Lebanon

H1: There are sociodemographic differences influencing eating motivations in Lebanon

Age, gender, housing situation, level of education, responsibility in purchasing food, civil status, and present employment situation were the main sociodemographic variables that the researchers focused on in terms of how they affect food motivation.

*T*-test for gender and responsibility in buying food results are shown in Tables 1 and 2, the results show that we can reject the null hypothesis and state that the variable gender has a significant difference only for the motivation factor economic and availability motivation,

**Table 2:** T-test for gender and responsibility in buying food results

Food motivations	Responsibility for buying food	N	Mean	Std. deviation	F	Sig.	t	df																																																												
Healthy motivation	No	102	3.4510	0.59081	0.008	0.927	-2.618	408																																																												
	Yes	308	3.6429	0.65749					Emotional motivation	No	102	3.45	1.050	1.197	0.274	1.509	408	Yes	308	3.28	0.979	Economic and availability motivation	No	102	2.76	0.858	0.706	0.401	-1.479	408	Yes	308	2.91	0.828	Environmental and political motivation	No	102	3.28	0.837	0.057	0.811	-1.227	408	Yes	308	3.40	0.815	Social and cultural motivation	No	102	2.91	0.797	0.125	0.724	-0.545	408	Yes	308	2.96	0.790	Marketing and commercial motivation	No	102	3.20	0.784	0.366	0.546	-1.237
Emotional motivation	No	102	3.45	1.050	1.197	0.274	1.509	408																																																												
	Yes	308	3.28	0.979					Economic and availability motivation	No	102	2.76	0.858	0.706	0.401	-1.479	408	Yes	308	2.91	0.828	Environmental and political motivation	No	102	3.28	0.837	0.057	0.811	-1.227	408	Yes	308	3.40	0.815	Social and cultural motivation	No	102	2.91	0.797	0.125	0.724	-0.545	408	Yes	308	2.96	0.790	Marketing and commercial motivation	No	102	3.20	0.784	0.366	0.546	-1.237	408	Yes	308	3.31	0.798								
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whereas there are no gender differences for remaining food motivation factors. As for the responsibility in buying food, we accept the null hypothesis since no differences were noted for the responsibility in buying foods leading to a specific food behavior.

The authors noted that the participants' eating motivations according to gender and, as it can be observed, for women, the most important motivation was health; whereas, men's food choices were mainly influenced by health as well as environmental and political concerns.

**Table 3:** ANOVA and mean

Food motivations	Age	N	Mean	Std. deviation	F	Sig.
Healthy motivation	Young adults	133	3.4436	0.59561	4.369	0.005
	Average adults	236	3.6864	0.65492		
	Senior adults	32	3.5313	0.50701		
	Elderly	8	3.7500	1.16496		
	Total	409	3.5966	0.64632		
Emotional motivation	Young adults	133	3.56	1.018	10.103	0.000
	Average adults	236	3.21	0.920		
	Senior adults	32	2.88	1.157		
	Elderly	8	4.50	0.535		
	Total	409	3.32	0.999		
Economic and availability motivation	Young adults	133	2.85	0.802	0.789	0.501
	Average adults	236	2.91	0.812		
	Senior adults	32	2.69	0.896		
	Elderly	8	3.00	1.512		
	Total	409	2.88	0.832		
Environmental and political motivation	Young adults	133	3.35	0.789	0.130	0.942
	Average adults	236	3.38	0.840		
	Senior adults	32	3.34	0.745		
	Elderly	8	3.50	1.195		
	Total	409	3.37	0.821		
Social and cultural motivation	Young adults	133	3.04	0.690	3.788	0.011
	Average adults	236	2.96	0.768		
	Senior adults	32	2.53	0.983		
	Elderly	8	2.75	1.581		
	Total	409	2.95	0.792		
Marketing and commercial motivation	Young adults	133	3.41	0.676	6.359	0.000
	Average adults	236	3.28	0.809		
	Senior adults	32	2.81	0.780		
	Elderly	8	2.75	1.389		
	Total	409	3.28	0.796		

**Table 4:** ANOVA and mean results of education degree and food motivation factors

Food motivations	Education level	N	Mean	Std. deviation	F	Sig.
Healthy motivation	University	390	3.5744	0.64800	6.986	0.001
	Primary school	2	3.0000	0.00000		
	Secondary school	18	4.1111	0.32338		
	Total	410	3.5951	0.64620		
Emotional motivation	University	390	3.31	0.990	2.921	0.055
	Primary school	2	5.00	0.000		
	Secondary school	18	3.39	1.092		
	Total	410	3.32	0.998		
Economic and availability motivation	University	390	2.88	0.828	1.406	0.246
	Primary school	2	2.00	0.000		
	Secondary school	18	2.72	1.018		
	Total	410	2.87	0.836		
Environmental and political motivation	University	390	3.37	0.823	0.226	0.798
	Primary school	2	3.00	0.000		
	Secondary school	18	3.33	0.840		
	Total	410	3.37	0.821		
Social and cultural motivation	University	390	2.95	0.784	0.004	0.996
	Primary school	2	3.00	0.000		
	Secondary school	18	2.94	0.998		
	Total	410	2.95	0.791		
Marketing and commercial motivation	University	390	3.28	0.783	0.164	0.849
	Primary school	2	3.00	0.000		
	Secondary school	18	3.33	1.085		
	Total	410	3.28	0.795		

**Table 5:** ANOVA and mean results of living environment and food motivation factors

Food motivations	Living environment	N	Mean	Std. deviation	F	Sig.
Healthy motivation	Rural	62	3.2097	0.81255	16.447	0.000
	Suburban	123	3.7642	0.58787		
	Urban	225	3.6089	0.58088		
	Total	410	3.5951	0.64620		
Emotional motivation	Rural	62	3.27	1.011	0.154	0.857
	Suburban	123	3.36	1.041		
	Urban	225	3.32	0.974		
	Total	410	3.32	0.998		
Economic and availability motivation	Rural	62	2.90	0.762	0.421	0.657
	Suburban	123	2.81	0.803		
	Urban	225	2.89	0.875		
	Total	410	2.87	0.836		
Environmental and political motivation	Rural	62	3.21	0.890	2.032	0.132
	Suburban	123	3.33	0.754		
	Urban	225	3.44	0.833		
	Total	410	3.37	0.821		
Social and cultural motivation	Rural	62	2.95	0.711	0.005	0.995
	Suburban	123	2.94	0.813		
	Urban	225	2.95	0.803		
	Total	410	2.95	0.791		
Marketing and commercial motivation	Rural	62	3.19	0.827	2.287	0.103
	Suburban	123	3.41	0.651		
	Urban	225	3.24	0.852		
	Total	410	3.28	0.795		

When it comes to age differences, the ANOVA results (Table 3) showed the existence of age difference for three motivations: healthy motivation, marketing and commercial motivation, and emotional motivation. We can reject the null hypothesis and state that the variable age has a significant difference for the mentioned three motivations.

As shown in Table 4, related to ANOVA test results for healthy motivation and level of studies, we can reject the null hypothesis and state that the variable education level has a significant difference for one motivation factor that is healthy motivation. As for the other motivation variables we can accept the null hypothesis.

As for the results of healthy motivation factors and living area as shown in Table 5, we can reject the null hypothesis and state that the variable living area has a significant difference for just one motivation which is healthy motivation. As for the other motivation variables we can accept the null hypothesis.

There are differences for three food motivation factors and civil status; the healthy, emotional, and social

and cultural motivations have a significant difference. We can reject the null hypothesis and state that the variable civil status has a significant difference for the mentioned three motivations (Table 6).

Another sociodemographic variable is the current employment situation that was tested for significant difference in food motivation factors; the results showed that there are significant differences in these groups' motivations except for emotional motivation. We can reject the null hypothesis and state that the variable current employment situation has a significant difference for five food motivations (Tables 7 and 8).

### 4.3 Results for RQ2

In order to respond to this second research question, we performed a regression analysis on two different models, the first of which considered the influence of the six-food motivator on habit and consumer food behavior.

**Table 6:** ANOVA and mean results of civil status and food motivation factors

Food motivations	Marital status	N	Mean	Std. deviation	F	Sig.
Healthy motivation	Single	164	3.3841	0.60061	11.563	0.000
	Married/living together	233	3.7339	0.64160		
	Divorced/separated	11	3.6364	0.50452		
	Widow	2	4.5000	0.70711		
	Total	410	3.5951	0.64620		
Emotional motivation	Single	164	3.42	1.057	3.001	0.030
	Married/living together	233	3.24	0.931		
	Divorced/separated	11	3.18	1.250		
	Widow	2	5.00	0.000		
	Total	410	3.32	0.998		
Economic and availability motivation	Single	164	2.82	0.850	2.537	0.056
	Married/living together	233	2.91	0.815		
	Divorced/separated	11	2.45	0.820		
	Widow	2	4.00	1.414		
	Total	410	2.87	0.836		
Environmental and political motivation	Single	164	3.41	0.843	0.968	0.408
	Married/living together	233	3.35	0.806		
	Divorced/separated	11	3.36	0.809		
	Widow	2	2.50	0.707		
	Total	410	3.37	0.821		
Social and cultural motivation	Single	164	2.98	0.730	4.038	0.008
	Married/living together	233	2.95	0.813		
	Divorced/separated	11	2.27	0.786		
	Widow	2	4.00	1.414		
	Total	410	2.95	0.791		
Marketing and commercial motivation	Single	164	3.35	0.733	0.858	0.463
	Married/living together	233	3.23	0.807		
	Divorced/separated	11	3.27	1.348		
	Widow	2	3.50	0.707		
	Total	410	3.28	0.795		



The second model takes into account the effects of the previous sociodemographic variables on dietary habits and consumer behavior.

#### 4.3.1 Model one

For the impact and relationship of motivation food factors on consumer behavior a model was tested in this research with, a Pearson correlation test between these motivations and a multiple regression was conducted; the results of first model (Figure 3) are reported in Table 9 and showed that Lebanese population has the highest level for the healthy diet behavior and attitude followed by the environmental and political motivation,

whereas the social and cultural motivation has the lowest mean (Table 10).

Furthermore, a multiple regression was run, and the multiple correlation coefficient  $R$  can be considered to be one measure of the quality of the prediction of the dependent variable healthy diet behavior and attitude. Its value of 0.373 indicates a good level of prediction. The coefficient of determination  $R^2$ , which is the proportion of variance in the dependent variable that can be explained by the independent variables has a value of 0.139 that our independent variables explain 13.9% of the variability of our dependent variable (Tables 11 and 12).

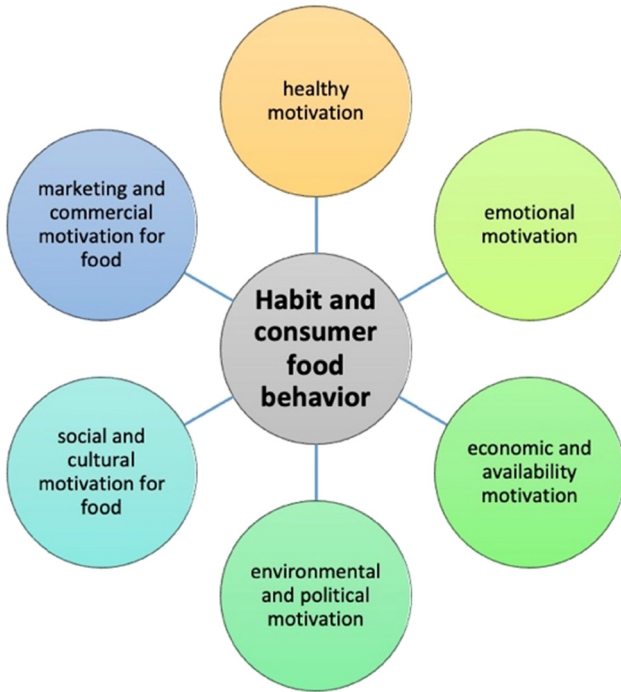
The  $F$ -ratio in the ANOVA table tests whether the overall regression model is a good fit of the data, which is the case in our model since we have that the

**Table 7:** ANOVA and mean results of current employment situation and food motivation factors

Food motivations	Employment status	<i>N</i>	Mean	Std. deviation	<i>F</i>	Sig.
Healthy motivation	Employed	279	3.5699	0.67426	3.847	0.004
	Unemployed	59	3.7627	0.59709		
	Student	54	3.5000	0.50469		
	Retired	7	4.2857	0.48795		
	Student worker	11	3.3636	0.50452		
	Total	410	3.5951	0.64620		
Emotional motivation	Employed	279	3.26	0.978	1.177	0.320
	Unemployed	59	3.36	0.905		
	Student	54	3.50	1.112		
	Retired	7	3.43	1.718		
	Student worker	11	3.73	0.786		
	Total	410	3.32	0.998		
Economic and availability motivation	Employed	279	2.89	0.759	2.931	0.021
	Unemployed	59	2.86	1.121		
	Student	54	2.63	0.808		
	Retired	7	3.43	1.134		
	Student worker	11	3.36	0.505		
	Total	410	2.87	0.836		
Environmental and political motivation	Employed	279	3.30	0.841	2.474	0.044
	Unemployed	59	3.42	0.875		
	Student	54	3.56	0.664		
	Retired	7	3.43	0.535		
	Student worker	11	3.91	0.539		
	Total	410	3.37	0.821		
Social and cultural motivation	Employed	279	2.88	0.777	4.090	0.003
	Unemployed	59	3.00	0.891		
	Student	54	3.24	0.612		
	Retired	7	3.57	1.272		
	Student worker	11	2.64	0.505		
	Total	410	2.95	0.791		
Marketing and commercial motivation	Employed	279	3.20	0.802	4.246	0.002
	Unemployed	59	3.31	0.933		
	Student	54	3.46	0.503		
	Retired	7	4.00	0.000		
	Student worker	11	3.82	0.751		
	Total	410	3.28	0.795		

**Table 8:** ANOVA and mean results of field of work and food motivation factors

Food motivations	Profession	N	Mean	Std. deviation	F	Sig.
Healthy motivation	Nutrition	26	3.7308	0.53349	1.077	0.375
	Food	5	3.6000	0.54772		
	Agriculture	2	4.0000	0.00000		
	Sports	57	3.6667	0.54554		
	Psychology	3	4.0000	0.00000		
	Health-related activities	29	3.7241	0.52757		
	The professional activity is not related to any of the above areas	288	3.5486	0.68666		
	Total	410	3.5951	0.64620		
Emotional motivation	Nutrition	26	3.19	1.021	2.449	0.024
	Food	5	2.40	0.548		
	Agriculture	2	4.00	0.000		
	Sports	57	3.19	1.076		
	Psychology	3	3.67	0.577		
	Health-related activities	29	3.83	0.759		
	The professional activity is not related to any of the above areas	288	3.32	0.995		
	Total	410	3.32	0.998		
Economic and availability motivation	Nutrition	26	2.81	0.939	1.317	0.248
	Food	5	2.80	0.447		
	Agriculture	2	3.00	0.000		
	Sports	57	2.61	0.921		
	Psychology	3	2.67	0.577		
	Health-related activities	29	2.79	0.675		
	The professional activity is not related to any of the above areas	288	2.94	0.828		
	Total	410	2.87	0.836		
Environmental and political motivation	Nutrition	26	3.62	0.983	0.731	0.625
	Food	5	3.00	0.000		
	Agriculture	2	3.00	0.000		
	Sports	57	3.33	0.873		
	Psychology	3	3.67	0.577		
	Health-related activities	29	3.31	0.806		
	The professional activity is not related to any of the above areas	288	3.37	0.807		
	Total	410	3.37	0.821		
Social and cultural motivation	Nutrition	26	3.12	0.711	1.312	0.250
	Food	5	2.80	0.447		
	Agriculture	2	2.00	0.000		
	Sports	57	3.02	0.790		
	Psychology	3	3.33	0.577		
	Health-related activities	29	3.14	0.693		
	The professional activity is not related to any of the above areas	288	2.91	0.810		
	Total	410	2.95	0.791		
Marketing and commercial motivation	Nutrition	26	3.00	0.980	2.445	0.025
	Food	5	2.40	0.548		
	Agriculture	2	3.00	0.000		
	Sports	57	3.18	0.947		
	Psychology	3	3.00	0.000		
	Health-related activities	29	3.52	0.574		
	The professional activity is not related to any of the above areas	288	3.32	0.758		
	Total	410	3.28	0.795		



**Figure 3:** Impact of motivation food factors and consumer behavior model.

independent variables statistically significantly predict the dependent variable,  $F(6, 403) = 10.828, p < 0.0005$ .

A multiple regression was run to predict healthy diet behavior and attitude from the six food motivation factors. These variables statistically significantly predicted Lebanese food behavior and attitude,  $F(6, 403) = 10.828, p < 0.0005, R^2 = 0.139$ . Four variables marketing and commercial motivation for food, social and cultural motivation for food, environmental and political motivation, and economic and availability motivation did not add statistically significantly to the prediction,  $p < 0.05$ ; whereas, emotional motivation and healthy motivation variable add statistically significantly to the prediction model (Table 13).

The general form of the equation to predict healthy diet behavior and attitude from food motivation factors in Lebanon is

$$PHDBA = 1.214 + MCM \cdot 0.03 + SCM \cdot 0.082 + EPM \cdot 0.001 + EAM \cdot 0.051 + EM \cdot 0.17 + HM \cdot 0.323, \quad (1)$$

where PHDBA is the predicted healthy diet behavior and attitude, MCM is the marketing and commercial motivation, SCM is the social and cultural motivation, EPM is the environmental and political motivation, EAM is the economic and availability motivation, EM is the emotional motivation, and HM is the healthy motivation.

**Table 9:** Summary of findings related to sociodemographic differences

Variables	Healthy motivation	Emotional motivation	Economic and availability motivation	Environmental and political motivation	Social and cultural motivation	Marketing and commercial motivation
Age	Significant difference	Significant difference				Significant difference
Highest education level	Significant difference					
Living environment	Significant difference				Significant difference	
Civil state	Significant difference	Significant difference				
Present professional	Significant difference		Significant difference	Significant difference	Significant difference	Significant difference
Gender						
Responsibility for buying food			Significant difference			

Table 10: Correlations between the sociodemographic variables

	Healthy motivation	Emotional motivation	Economic and availability motivation	Environmental and political motivation	Social and cultural motivation	Marketing and commercial motivation
Healthy motivation	1					
Emotional motivation	0.108*	1				
Economic and availability motivation	0.111*	0.152**	1			
Environmental and political motivation	0.261**	0.063	0.049	1		
Social and cultural motivation for food	0.165**	0.241**	0.378**	0.112*	1	
Marketing and commercial motivation for food	0.088	0.252**	0.363**	0.136**	0.307**	1

\*Correlation is significant at the 0.05 level (2-tailed). \*\*Correlation is significant at the 0.01 level (2-tailed).

Table 11: Summary for model one

$R^2$	$R^2$	Adjusted $R^2$	Std. error of the estimate
0.373	0.139	0.126	0.823

<sup>a</sup>Predictors: (Constant), healthy motivation, marketing and commercial motivation for food, emotional motivation, environmental and political motivation, social and cultural motivation for food, economic and availability motivation.

### 4.3.2 Model two

As for the sociodemographic variables that might influence habits and consumer food behavior, a second model was conceptualized and tested (Figure 4).

A multiple regression was run to predict healthy diet behavior and attitude from the sociodemographic factors. These variables statistically significantly predicted Lebanese food behavior and attitude,  $F(8, 400) = 1.922$ ,  $p < 0.0005$ ,  $R^2 = 0.037$ . All sociodemographic variables are not statistically significant to the prediction,  $p < 0.05$  (Tables 14 and 15).

The general form of the equation to predict healthy diet behavior and attitude from Lebanese sociodemographic variable is

$$PHDBA = 3.231 + AG*0.032 - GD*0.155 - HELC*0.053 + LE*0.025 + CS*0.059 + PPA*0.065 + APA*0.01 - RBF*0.287, \quad (2)$$

where PHDBA is the predicted healthy diet behavior and attitude, AG is the age, GD is the gender, HELC is the highest education level completed, LE is the living environment, CS is the civil state, PPA is the present professional activity, APA is the area of professional activity, and RBF is the responsibility to buy food (Table 16).

Table 12: ANOVA for model one (dependent variable: healthy diet behavior and attitude)

Model <sup>a</sup>	Sum of squares	df	Mean square	F	Sig.
Regression	43.950	6	7.325	10.828	0.000
Residual	272.638	403	0.677		
Total	316.588	409			

<sup>a</sup>Predictors: (Constant), healthy motivation, marketing and commercial motivation for food, emotional motivation, environmental and political motivation, social and cultural motivation for food, economic and availability motivation.

**Table 13:** Coefficients for model one (dependent variable: healthy diet behavior and attitude)

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
(Constant)	1.214	0.309		3.924	0.000
Marketing and commercial motivation	0.030	0.057	0.027	0.528	0.598
Social and cultural motivation	0.082	0.058	0.074	1.421	0.156
Environmental and political motivation	0.001	0.052	0.001	0.021	0.983
Economic and availability motivation	0.051	0.055	0.049	0.937	0.349
Emotional motivation	0.170	0.043	0.193	3.964	0.000
Healthy motivation	0.323	0.066	0.237	4.883	0.000

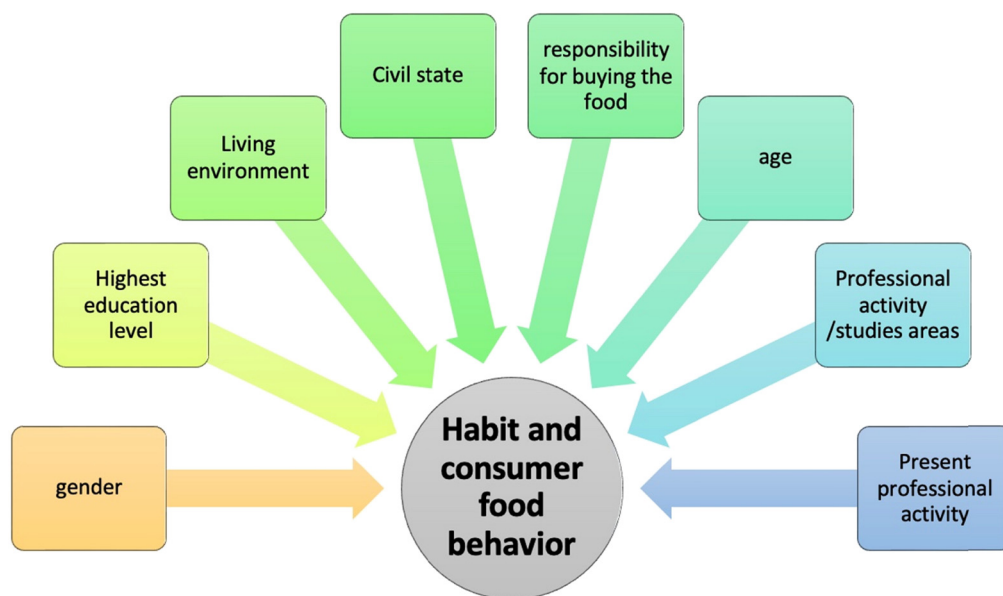
## 5 Discussion

These findings are not unexpected because people’s eating choices tend to be heavily influenced by their level of health [32]. Consumers are more aware of the environmental effects of their meals and the significance of adopting diets that are more sustainable from an environmental point of view in addition to health motivations [33].

When it comes to the gender differences, the findings of the *T*-test revealed that, with the exception of social and cultural reasons ( $p = 0.21$ ), differences between genders were statistically significant for practically every type of incentive. Nevertheless, because the average scores for both men and women were always lower than 1.5, none of the motivational factors that were taken into consideration had much of an impact on how they chose to eat. These findings are consistent with an earlier study that discovered

that women tend to have stronger positive motives for eating a healthy diet because they are generally more concerned with controlling their diet, weight, and health [34].

As for the age variable, in late adulthood, age is a significant factor in society and has a negative impact on people’s health and wellbeing. The impacts of ageism on older people have been the subject of much research, particularly in relation to the treatment they receive from the medical system and the contacts they have at work [35]. There is evidence that one’s thoughts toward aging can have a significant impact on one’s health and wellbeing. Negative views of aging and outdated pre-conceptions are linked to memory problems [36], poor physical and mental functioning [37], and lower cardiovascular health [38]. Ageing is a dynamic process; people change from one category to another as they live – from young adulthood to middle adulthood to elder adulthood.



**Figure 4:** Impact of sociodemographic factors and consumer food behavior model.

**Table 14:** Summary for model two

$R^a$	$R^2$	Adjusted $R^2$	Std. error of the estimate
0.192	0.037	0.018	0.870

<sup>a</sup>Predictors: (Constant) Are you responsible for buying the food you eat? living environment; highest education level completed; professional activity/studies related to any of the following areas; gender; present professional activity; age; civil state.

**Table 15:** ANOVA for model two (dependent variable: healthy diet behavior and attitude)

Model <sup>a</sup>	Sum of squares	df	Mean square	F	Sig.
Regression	11.644	8	1.455	1.922	0.055
Residual	302.889	400	0.757		
Total	314.533	408			

<sup>a</sup>Predictors: (Constant) Are you responsible for buying the food you eat? living environment; highest education level completed; professional activity/studies related to any of the following areas; gender; present professional activity; age; civil state.

This contrasts with other stigmatized identities and societal categories (such as race, gender, and sexual orientation). People of all ages likely come across fresh knowledge and experiences that cause them to re-evaluate how they feel about older people and aging. However, there is no evidence of age variations in attitudes and behaviors related to food. The current study filled this gap by analyzing cross-sectional age differences in food motives and demonstrating the divergent attitudes about food consumption between older and younger persons.

As for the environmental variables, they may be outweighing those of commodity or even price due to increased awareness of the effects of climate change and pollution, as

people place value on intangible benefits related to the preservation of the natural biosystems.

The ability to respond intelligently to questions and possess sufficient knowledge does not always mean that one uses that knowledge in daily interactions. Participants in a study had adequate nutrition knowledge, but social and physical contextual factors had a significant impact on eating behavior [39]. The role of social media in spreading information about healthy eating and promoting healthy food choices is highlighted by Mete et al. [40].

Overall, the findings supported the fact that Lebanese citizens were sufficiently informed about some nutritional components of their diets and were not influenced by marketing campaigns or other influencing factors. These findings are conformed to the findings of Boustani et al. [41], where Lebanese people are becoming more aware of what they consume and the implications that a proper diet can have for their health. Consequently, they had beliefs that were consistent with a balanced diet.

These findings are crucial because they can help determine how people view healthy eating concerns, which is essential for promoting and putting into practice plans meant to encourage healthier eating patterns among Lebanese people. Moreover, these findings can help in conducting different communication tools for increasing the knowledge about healthy food consumption and positively changing in food habits behavior, specifically for the fact that the habit of checking food labels is not current for Lebanese citizens [42].

This work further showed some of the factors that strongly influence the participants' eating habits, such as politics, the environment, and health. The fact that consumers are aware of the role of food choice over the environment allows to put into practice programs that help raise awareness of these aspects, including sustainable

**Table 16:** Coefficients for model two (dependent variable: healthy diet behavior and attitude)

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
(Constant)	3.231	0.285		11.332	0.000
1. Age	0.032	0.088	0.024	0.368	0.713
2. Gender	-0.155	0.102	-0.078	-1.529	0.127
3. Highest education level completed	-0.053	0.105	-0.025	-0.506	0.613
5. Living environment	0.025	0.060	0.021	0.415	0.678
6. Civil state	0.059	0.112	0.038	0.525	0.600
7. Present professional activity	0.065	0.049	0.071	1.333	0.183
8. Professional activity	0.010	0.025	0.019	0.391	0.696
9. Responsibility for buying the food you eat	-0.287	0.112	-0.141	-2.552	0.011

food choices. As a result, the sustainability and environmental aspects could be thoroughly investigated in other future studies. According to Boustani et al. [41], the subjective norm, which reflects the influence of others, was found to be significantly connected with the frequency of consumption of popular goods like organic products and to have a strong correlation with the intention to purchase organic food. As a result, in future work, the authors would take into account the consumption of organic food or even cultural and ethnic foods that are not typically eaten in Lebanon.

Future research ideas include expanding the sample size and even including additional neighboring nations. The sample size of participants from varied origins and environments must be raised in any subsequent study, though. As a result, this study may provide a fair representation of a variety of consumer behaviors across the entire Lebanese nation.

Furthermore, a study by Mete et al. [40] found that price was the primary factor in Portuguese and Greek consumers' food selection decisions. Given that the Lebanese population is currently experiencing multiple financial and economic crises, it is important to consider the cost of goods when making food purchases. Among the motivating elements, the economic considerations variable had the greatest correlation. It is a well-known fact that Lebanon has a high cost of living.

The study provides important insight into consumer behavior by examining the factors that influence consumers' purchasing intentions for food. Future studies on the supply and demand of food may utilize the findings of this study as a springboard. On the other hand, more in-depth research on the relationship between consumer attitude and purchase intention may be conducted using qualitative techniques like focus groups or face-to-face interviews.

## 6 Conclusions

This study offered new perspectives on behavioral and perception elements associated with eating motivations, particularly those connected to health-related features and views of a good diet. In general, participants demonstrated correct attitudes toward a healthy diet, with substantial variations in the results according to gender, age group, living situation, and educational level. The participants who had to pay for their own food or not, as well as the groupings according to their employment status or field of expertise, on the other hand, varied significantly.

Our study found that the social environment has a significant impact on nutrition, which is a crucial factor in the development and maintenance of healthy eating behaviors. Examples include frequent dining out, a preference for trendy or fast food, lack of time for cooking when one is a young adult, etc. Therefore, creating healthy eating plans and promoting them are long-term benefits, particularly for young people's eating habits.

This research also made it possible to pinpoint some of the factors, such as politics, the environment, and health that participants' eating habits were most influenced by. These can be used to adopt and put into practice programs that help raise awareness of the value and role of recycling and the environment.

According to global estimates, low-income countries like Lebanon today, which struggle with multiple crises and high inflation rates, are more affected by changes in food prices. As a result, there is a clear need for information and understanding about consumer practices and attitudes regarding food in order to assess the results of marketing programs and the risks of population malnutrition.

In an effort to reduce the burden of disease on the population, it is important to take socioeconomic status into account when modifying eating habits among the general population. Strategically combining the promotion of high consumption of fresh fruits and vegetables with other approaches and using social marketing to obtain the health benefits are both important. A deeper comprehension of these tactics can aid the development of policies resulting in a balanced diet by the restaurant syndicates, ministry of tourism, and ministry of health.

One limitation is that the study is conducted in an environment where socioeconomic factors changed very fast and people's eating habits needed time to adapt to the variation in the social status of certain citizens who might have lost their work due to Covid-19 or due to financial crisis or are simply unable to retrieve their savings from banks due to capital control.

The sample size might be increased in future studies, and even more surrounding countries could be included. Any further research, however, must include a larger sample size with participants from diverse backgrounds and environments. As a result, this study may offer a realistic depiction of the range of consumer habits found throughout the entire Lebanese country.

As for future work, the researchers intend to add to the Theory of Planned Conduct and to test the mediating or moderating role of moral concern indicators, which have been shown to be pertinent for particular food consumption choices.

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**Data availability statement:** The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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