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# Exploring the impact of COVID-19 pandemic on college students' Food Choice Motives in Greece

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**Abstract:** We are already more than year away from the pandemic period, followed by a year within a global economic crisis and a war in Ukraine, with the marks and the changes caused in all parameters of life becoming clear now including food choice motives of citizens worldwide. In this study we investigate the food choice motives changes due to the COVID-19 to college students in Greece in the 10 key food motives namely health, convenience, sensory, appeal, nutritional quality, moral concerns, weight control, mood and stress, familiarity, price, and shopping frequency and behavior. A sample of 1017 college students answered the questionnaire survey through Google platform conducted in January to February 2023. The collected data was analyzed with the use of statistical tools, combined cross and Chi-square tests. Students exhibit quiet and very important preferences on health, convenience, weight control, and mood and stress. Food choices related to sensory appeal, nutritional quality, and familiarity is of less importance for the students, similarly to ethical concerns expect the environmental impact of the food which is high to their concern. The motive which continues to have the highest concern for students before and after the pandemic is price looking for value for money food (88.8%), not to be expensive (80.7%), and be cheap (78.7%). The shopping frequency and behavior motives, which were changed during the pandemic, have now returned to the motives of the pre pandemic period, with purchase of foods from supermarket (29%), local grocery (37.6%), and only 12.3% via online, and 20.4% by delivery, weekly or every two weeks. They prefer to cook at home full meals is now very high reaching 74.4%, avoiding eating at a restaurant or fast food (only 27% positives answers). Our findings indicate that students have already returned to their food choice motives of the period before COVID-19 except the home cooking food which is now high in their preference.

**Keywords:** Food Choice Motives (FCM); food insecurity (FI); food security (FS); college students

## 1. Introduction

### *1.1. The new Food choices after the COVID-19 pandemic*

Covid-19 posed a significant risk to global public health and the economy. According to the World Health Organization (WHO) the impact on lifestyles and food consumption is significant, despite the obvious health and safety benefits to people of the measures imposed [1] . The adoption of healthy lifestyles is of benefit for physical and mental health, as it helps to reduce the danger of chronic heart, diabetes and obesity diseases and improve life quality [2]. When consumers undergo changes in their social, environmental and family context their habits are vulnerable to change, as they are involved in a new manual decision-making process [3]. Food choice decisions arise from individual's personal nutritional values, which are shaped by life events, personal and social factor.

A balanced diet with fruits, vegetables, whole grains, lean proteins, and healthy fats helps strengthening the immune system and reducing the severe illness incidences from COVID-19 [4]. Maintaining a healthy weight, avoiding processed foods, and limiting alcohol and sugar intake may help reduce the risk of contracting the virus [5]. For many consumers, the pandemic has created a unique opportunity to develop and maintain healthy lifestyle habits [6]. Initial reports before and

during the pandemic showed significant alterations to balanced diets and may lead to better lifestyle and health [7]. A 15-multicounty study during the first lockdown showed an increased attitude for home cooking, together with decreased concern with the convenience attributes of food (such as choice of processed products and fast food meals) [8].

Food choice motives (FCM) refer to the reasons for choosing or consuming particular foods with the main ten key motives being health, convenience, sensory appeal, nutritional quality, moral concerns, weight control, mood and anxiety, familiarity, price and shopping frequency behavior [9]. We explored the impact of Covid -19 on FCM in a systematic review recently [10]. The findings, based on the limited studies published so far, show that changes in food choices are controversial depending on the country of origin, the age, the sex of those questioned, and can go in both directions. In three to five years when the new consumers' habits will be settled, and adequate studies will be published, definite answers to the new FCM will be defined [11]. Until then researchers will continue to explore different parameters and factors effecting food choices to understand the science behind changes and motives better. In this study, for the first time, we investigate the food choices and preferences of college students who have been living in quarantine and socially distancing for almost two years, and they are now experiencing a normal life.

### *1.2. Literature Review*

As students have been living in quarantine and socially distancing, their access to food and their motivation for choosing certain foods has changed. However, due to the limited time period after the pandemic the studies evaluating the new students' habits and preferences are limited so far. An early study among Polish secondary school students during the pandemic reported increased value of weight control and health determinants, and decreased value of sensory appeal and mood, with the rest of the determinants equally important compared with the pre COVID period, promoting the uptake of a better diet in the new era [12]. Luo et al. reviewed the reports regarding available changes on parental feeding practices because of the pandemic [13]. Parents used various practices of feeding, such as high levels of coercive control and reduction of rules and limits, changes which are expected to affect the food choices of the youngsters when they will become college students.

Indeed, Wang et al. reports that retrospective parental feeding practices are important parameters of college students' weight levels and ratification and that appetitive traits answer these relationships in the Chinese context in the post COVID 19 era [14]. Among college students, findings before the pandemic underscore the need to promote healthy weight management practices with attention to diet and physical activity which prompts balance against extremes [15]. Pearcey and Zhan studied FCMs among American and Chinese college students just before the pandemic in a comparative way [16]. The findings indicate that the two cultural groups viewed sensory appeal, weight, health, mood and familiarity similarly. The participants from USA score better on price and convenience whereas the participants from China performed better on natural content and ethical concerns. Owens et al reported on food insecurity among American college students during COVID-19 highlighting the high prevalence during COVID-19 with college students experiencing insecurity in house and/or less income being impacted the most [17]. Wattick et al reports on quality and eating behaviors of college students with food addiction in the post COVID era [18]. They showed significantly negative expectations for healthy and junk food, lower preference for vegetables, higher preferences for added sugars and saturated fat, while they described eating connected with negative emotions, and feelings after eating. Hoge et al studied recently the food choices of college students with health literacy in connection with front-of-package nutritional labels and found that Nutri-Score is helpful in guiding students in their choices of food [19]. Niescwitz et al., just before the pandemic, studied the connection between food insecurity (FI) and FCM in college students, and found that FCM increase as FI increases maybe due to food obsessive habits [20]. At the same time Richards et al. evaluated experiences of college students who are food secure (FS) and FI with factors connected to food choices [21]. Both type of students obtained food from similar sources (e.g. super markets), reported transportation barriers effecting the amount of package size of food purchased, and knowledge, attitudes, use and familiar history of food assistance effecting the kind of food purchased.

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Students with FI exhibited other priorities over food, and when funds were low, they reduced food consumption experiencing a variation in food supply on a monthly basis to enhance financial stability. Mialki et al. compared FS status before and after the pandemic among college students [22] and found changes in both directions 59,6% becoming less FS, and 40.4% becoming more FS. Saha et al reviewed recently the reports on factors affecting fast food consumption patterns and factors among college students in South Asia [23]. Factors such as mass index, study groups, being younger, gender, low nutrition knowledge, internet addiction, higher socio-economic class played positive role in fast food consumption. Finally Stanojevic et al., within the pandemic period, investigated the eating habits of Serbian college students and why they consume traditional food, comparing the attitudes with those identified in 6 other European countries [24]. When buying traditional food, the connection with family and food taste is the main reason selecting traditional foods, with the declaration on the product not being a significant factor, while the answers of the respondents were close to the answers obtained by participants in Poland.

We have shown the importance of FCMs not only for adults but for college students also especially in the new post COVID-19 era when the consumers' perceptions and preferences are changing dramatically. The scope of this research is therefore to explore for the first time the impact of COVID-19 and beyond on FCM of college students. To accomplish the scope according to the literature on FCM [10] our research tests the following ten key determinants of college students' motives on food in the new era regarding food consumption and:

1. Health
2. Convenience
3. Sensory appeal
4. Nutritional quality
5. Ethical concern
6. Weight control
7. Mood and stress
8. Familiarity
9. Price
10. Shopping frequency behavior

## 2. Materials and Methods

### *2.1. Data collection and sample characterization*

A questionnaire was prepared to investigate the students' food choice motives, it was built up in ten parts (Table S1) based on a similar previous study [25]. The social-demographic characteristics of the respondents were searched in the first part (gender, age, civil state, job situation, and permanent residency). The parts 2-10 consisted of three questions each designed to assess the motives of students on health, convenience, sensory appeal, nutritional quality, ethical concern, weight control, mood and stress, familiarity and price while part 11 consisted of ten questions regarding the shopping frequency and behavior of Greek students. The questionnaire was initially tested on 50 people in order to ensure the understanding and clarity of the questions as well as the quality of the data obtained. The use of electronic questionnaires was the basis of the research due to their ease of distribution and collection during the semi-lock-down period. The distribution method chosen was by e-mail [26–28] using the snowball method in order to obtain a large number of participants [25]. The questionnaire was created and distributed using the Google Forms function due to the ease of generating the responses-results in an excel sheet. The geographical context of the present study was all Greek regions, divided into five regions. Students of the University of Ioannina with permanent residency outside the Ioannina area received e-mails explaining the purpose of the survey and the importance of their participation, while a link was attached that led to the electronic form of the questions. The respondents' personal information was secured and not associated with any of the responses.

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The sample of the population is very well distributed among students aged 18-25 years old. There were more female (69%) compared to male respondents (31%), similar to findings observed by other researches as well [26–28], leading to the conclusion that college female students respond more willingly to food-related surveys as they are involved in the household organization more than the male students.

The survey took place during the period January to February 2023 and consisted of 1017 participants (Table 1).

**Table 1.** Sociodemographic characterization of the sample.

| Variable | Groups | (%) |
|---|---|---|
| *Gender* | Male | 31.0 |
| | Female | 69.0 |
| *Age* | 18-20 | 38.0 |
| | 21-25 | 49.0 |
| | 26-30 | 7.5 |
| | 31-35 | 5.5 |
| *Civil state* | Single | 93.3 |
| | Married | 5.0 |
| | Divorced | 1.7 |
| *Job situation* | Employed student | 27.7 |
| | Unemployed student | 72.3 |
| *Residency* | NORTH GREECE (regions of Macedonia – Thrace) | 29.2 |
| | WEST GREECE (region of Epirus – Etoloakarnania prefecture) | 33.9 |
| | CENTRAL GREECE (including Athens) | 22.7 |
| | SOUTH GREECE (region of Peloponnese) | 5.7 |
| | ISLANDS | 8.5 |

In terms of geographical distribution, participants were 33.9% permanent residents of west Greece, 29.2% of North Greece, 22.7% residents of central Greece, 8.5% residents of the Greek islands, and 5.7% of south Greece. Most of the participants were aged between 18-20, and 21-25 years (38%, and 49% respectively). Regarding the employment status category, unemployed and single students (72.3% and 93.3%, respectively) dominated the respondents.

### *2.2. Data analysis*

The questionnaire was built up on a 5-point Likert scale (1 = not at all important, 2 = less important, 3 = moderately important, 4 = quite important, and 5 = very important) [29] to measure the students' motives related to food choices. Statistical treatment of data performed using IBM SPSS Statistics for Windows (Version 25.0, IBM Corp. Armonk, NY, USA) as previously been described in detail [30].

## 3. Results

Results presented in Table 2 show that for most of the students is quite and very important for the food they consume to contain a lot of vitamins (62.2%), a lot of fibers and proteins (60.7%) and can keep them healthy (67.7%). Also, it is quite and very important for the participants that the food they consume to take no time to be prepared (60.7%) or to be prepared easily (62.8%) and to be cooked very simply (61.3%). Regarding the sensory appeal, it is moderately and quite important for the students their food to look nice (56.2%), to have pleasant texture (62.9%), but the most important criteria by far with quite and very important to have good taste exceeding 90% of the responses (93.4%). While the presence of artificial ingredients and additives moderately concerns the

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participants (33.5% and 35.7%, respectively) the presence of natural ingredients is quite and very important for them by 62.33%. It is less important for the students the marking region of origin of the product (25.3%) but is quite and very important the respect of the environment (59%) and the environmentally friendly packaging (53.9%). Finally, regarding the weight control, it moderately concerns the students the calories (33.5%) and fat (32.1%) of the food they consume while it is quite important for them the food to help controlling their weight (27.2%).

**Table 2.** Students' motives on food consumption regarding health, convenience, sensory appeal, nutritional quality, and ethical concerns.

| **PREFERENCE REGARDING THE HEALTH OF THE FOODS in the POST COVID-19 era** | | | | | |
|---|---|---|---|---|---|
| **How important is for you the FOOD you eat** | **Not at all important** | **Less important** | **Moderately important** | **Quite important** | Very important |
| Contains a lot of vitamins and minerals | 2.5* | 8.6 | 26.7 | 39.7 | 22.5 |
| Keeps you healthy | 1.8 | 5.6 | 24.9 | 42.1 | 25.6 |
| It is high in proteins and fiber | 2.6 | 9.2 | 27.5 | 37.0 | 23.7 |
| PREFERENCE REGARDING THE CONVENIENCE OF THE FOODS in the POST COVID-19 era | | | | | |
| How important is for you the FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| Takes no time to prepare | 3.4 | 10.1 | 25.8 | 34.3 | 26.4 |
| It is easy to prepare | 3.2 | 10.0 | 24.0 | 38.0 | 24.8 |
| Can be cooked very simply | 4.5 | 11.2 | 23.0 | 36.0 | 25.3 |
| PREFERENCE REGARDING THE SENSORY APPEAL OF THE FOODS in the POST COVID-19 era | | | | | |
| How important is for you the FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| Looks nice | 10.9 | 21.5 | 31.2 | 25.0 | 11.4 |
| Has a pleasant texture | 3.1 | 8.8 | 24.7 | 38.2 | 25.2 |
| Tastes good | 0.3 | 0.7 | 5.6 | 26.4 | 67.0 |
| PREFERENCE REGARDING THE NUTRITIONAL QUALITY OF THE FOODS in the POST COVID-19 era | | | | | |
| How important is for you the FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| Contains no artificial ingredients | 5.0 | 19.7 | 33.5 | 26.9 | 14.9 |
| Contains natural ingredients | 3.5 | 9.0 | 25.1 | 36.3 | 26.1 |
| Contains no additives | 7.6 | 19.6 | 35.7 | 23.6 | 13.5 |
| PREFERENCE REGARDING THE ETHICAL CONCERN OF THE FOODS in the POST COVID-19 era | | | | | |
| How important is for you the FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| It has the region of origin clearly marked | 14.6 | 25.3 | 24.5 | 21.0 | 14.6 |
| It is packed in an environmentally friendly way | 6.6 | 13.9 | 25.6 | 32.6 | 21.3 |
| It respects the environment | 5.5 | 11.5 | 24.0 | 34.4 | 24.6 |
| PREFERENCE REGARDING THE WEIGHT CONTROL OF THE FOODS in the POST COVID-19 era | | | | | |
| How important is for you the FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| It is low in calories | 13.9 | 22.4 | 33.5 | 20.5 | 9.7 |
| It is low in fat | 10.2 | 22.3 | 32.1 | 23.4 | 12.0 |
| Helps with control weight | 10.7 | 18.7 | 26.5 | 27.2 | 16.9 |

* Values represent %.

The results of the chi-squarer test presented in Table S2 showed significant associations between students' motive on food consumption and sociodemographic variables regarding:

1. Health.

Contains a lot of vitamins: age ($x^2$ =27.718 , $p$ = 0.006), civil state ($x^2$ = 24.482, $p$ = 0.110), and residency ($x^2$ =26.400 , $p$ = 0.049).

2. Convenience.

The questions regarding students' motives on food consumption in the part exploring the convenience showed no statistically significant differences ($p<0.05$) and therefore significant associations with the sociodemographic variables.

3. Sensory appeal.

Looks nice : gender ($x^2$ =23.090 , $p$ = 0.000), and civil state ($x^2$ = 21.841, $p$ =0.005 ).

Pleasant texture : gender ($x^2$ = 27.539, $p$ =0.000),and age ($x^2$ = 28.081, $p$ = 0.005).

Good taste : gender ($x^2$ = 16.256, $p$ = 0.003),and age ($x^2$ = 24.731, $p$ = 0.016).

4. Nutritional quality.

Presence of artificial ingredients : gender ($x^2$ = 16.226, $p$ = 0.004), age ($x^2$ = 62.366, $p$ = 0.000), civil state ($x^2$ = 40.749, $p$ = 0.000), job situation ($x^2$ = 17.615, $p$ = 0.001) and residency ($x^2$ = 28.570, $p$ = 0.027).

Presence of natural ingredients : gender ($x^2$ =13.608 , $p$ = 0.009), age ($x^2$ = 44.855, $p$ = 0.000), and civil state ($x^2$ = 40.962, $p$ = 0.001).

Presence of additives : age ($x^2$ = 72.496, $p$ = 0.000), civil state ($x^2$ = 47.248, $p$ = 0.000), job situation ($x^2$ = 11.357, $p$ = 0.023) and residency ($x^2$ = 29.269, $p$ = 0.022).

5. Ethical concerns.

Marking the region of origin : gender ($x^2$ =12.491 , $p$ = 0.014), age ($x^2$ =68.238 , $p$ = 0.000), civil state ($x^2$ = 36.048, $p$ = 0.000), and job situation ($x^2$ = 13.051, $p$ = 0.011).

Environmentally packaged : gender ($x^2$ =33.856 , $p$ = 0.000).

Respect of the environment : gender ($x^2$ = 31.613, $p$ = 0.000).

6. Weight control

Low calories : gender ($x^2$ = 10.588, $p$ =0.032 ), age ($x^2$ =26.295 , $p$ = 0.010), and civil state ($x^2$ = 16.443, $p$ = 0.036).

Low fat: gender ($x^2$ = 9.528, $p$ = 0.049), and age ($x^2$ = 23.835, $p$ = 0.021).

Control weight: age ($x^2$ = 24.972, $p$ = 0.015).

As presented in Table 3, mood and stress and price seems to be important motives on food choice of students. Specifically, it is quite and very important for students that the food they consume can keep them awake (52.5%), in a cheerful mood (73.6%) and help them cope with everyday life (78.1%). Furthermore, price seems to be quite and very important for students', as they look for a good value for money product (88.8%) that it will not be expensive (80,7%) and will actually be cheap (78,7%). On the other hand, familiarity seems to be of less concerns to the students, since it is quite and very important for them the food they consume to be familiar to them only by 49.2%, to be what they usually eat only 42.5%, and to be like the food of their childhood only by 31.7%. Finally, regarding shopping frequency and behavior, students are moderately motived in consuming food that can be purchased from the supermarket (42.5%), or the local market (34.5%), or via online (23.4%), or by delivery (34.8%), or eaten at a restaurant or fast food (32.7%). It is only moderately important for them to purchase their food either weekly (29.4%), or every two weeks (37.1%). What is, quite and very important for the students those days is to cook the food they eat at home (74.4%) as a full meal and not as a fast-food preparation (only 27%). The value for money commodity of their food, is quite and very important for the students only by 52.3%, which is significantly lower as compared with the 88.8% choice for value for money actual price motive recorded above .

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**Table 3.** Students' motives on food consumption regarding mood and stress, familiarity, price and shopping frequency and behavior.

| PREFERENCE REGARDING THE MOOD & STRESS OF THE FOODS in the POST COVID-19 era | | | | | |
|---|---|---|---|---|---|
| How important is for you the FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| Keeps me awake / alert | 5.7* | 13.7 | 28.1 | 35.5 | 17 |
| Cheers me up | 2.9 | 5.7 | 17.8 | 41.9 | 31.7 |
| Helps me to cope with life | 2.2 | 4.1 | 15.6 | 39.6 | 38.5 |
| PREFERENCE REGARDING THE FAMILIARITY OF THE FOODS in the POST COVID-19 era | | | | | |
| How important is for you the TRADITIONAL FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| It is familiar | 5.3 | 15.1 | 30.4 | 35.1 | 14.1 |
| It is what I usually eat | 7.0 | 18.7 | 31.9 | 30.8 | 11.7 |
| It is like the food I ate when I was a child | 12.8 | 21.9 | 33.6 | 20.5 | 11.2 |
| PREFERENCE REGARDING THE PRICE OF THE FOODS in the POST COVID-19 era | | | | | |
| How important is for you the FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| It is good value for money | 0.8 | 2.0 | 8.4 | 38.1 | 50.7 |
| It is cheap | 1.4 | 3.9 | 16.0 | 41.7 | 37.0 |
| It is not expensive | 1.5 | 3.4 | 14.4 | 38.9 | 41.8 |
| PREFERENCE REGARDING SHOPPING FREQUENCY AND BEHAVIOR OF THE FOODS in the POST COVID-19 era | | | | | |
| How important is for you the FOOD you eat | Not at all important | Less important | Moderately important | Quite important | Very important |
| Purchased from supermarket | 7.6 | 20.9 | 42.5 | 21.8 | 7.2 |
| Purchased by the local market and grocery | 8.5 | 19.4 | 34.5 | 27.3 | 10.3 |
| Purchased online | 37.5 | 26.8 | 23.4 | 6.8 | 5.5 |
| Purchased every week | 11.4 | 20.9 | 29.4 | 25.8 | 12.5 |
| Purchased every two weeks or more | 10.2 | 21.5 | 37.1 | 23.3 | 7.9 |
| Can be cooked at home | 2.5 | 5.5 | 17.6 | 41.4 | 33.0 |
| Purchased by delivery | 15.4 | 29.4 | 34.8 | 15.5 | 4.9 |
| Can be eaten at a restaurant or fast food | 17.6 | 30.9 | 32.7 | 13.9 | 4.9 |
| Be prepared as a fast food | 23.4 | 22.6 | 27.0 | 19.3 | 7.7 |
| It is a "value for money" commodity | 8.3 | 11.1 | 28.3 | 32.2 | 20.1 |

* Values represent %.

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The results of the chi-squarer test presented in Table S3 showed significant associations between students' motive on food consumption and sociodemographic variables regarding :

7. Mood and stress
   Keeps awake: residency ($x^2 = 26.958$, $p = 0.042$).
   Cheerful mood: gender ($x^2 = 12.296$, $p = 0.015$).
8. Familiarity
   Familiar: gender ($x^2 = 11.604$, $p = 0.021$).
9. Price
   Cheap: gender ($x^2 = 13.397$, $p = 0.009$).
10. Shopping frequency and behavior
   Purchased every week: age ($x^2 = 33.852$, $p = 0.001$).
   Purchased every two weeks or more: residency ($x^2 = 30.963$, $p = 0.014$).
   Cooked at home: gender ($x^2 = 17.740$, $p = 0.001$), age ($x^2 = 28.694$, $p = 0.040$), and job situation ($x^2 = 14.882$, $p = 0.005$).
   Purchased by delivery: age ($x^2 = 21.485$, $p = 0.044$).
   'Value for money" commodity: civil state ($x^2 = 21.782$, $p = 0.005$), and residency ($x^2 = 28.485$, $p = 0.028$).

## 3. Discussion

The results presented above indicate that the students are turning to their FCM of the period before COVID-19, more or less in a normality mode, with only minor changes in terms of their preferences.

On health motives students are leaving behind the decreased physical activity, and the increase of junk food consumption recorded during the pandemic [31], and they are now interested for food which keeps them healthy, containing vitamins, fibers and proteins.

On convenience motives students are leaving behind the instant and frozen foods used during the pandemic [32], with preferences now to foods that are cooked simply, easily, and with no extra time of preparation.

On sensory appeal motives students have kept their preferences the same as before [33] and during the COVID-19 era [34] with moderate evaluation for the appearance, the texture, but the taste one of the most important criteria for food choice overall.

On nutritional quality motives students continue their strong preference for nutritional food [35] recorded before and during the pandemic in many countries with moderate importance for foods with natural ingredients, no additives, and no artificial ingredients.

On ethical concerns similar to their preference during the pandemic [36] students continue to pay increased attention to the environmental effects of the food, with low interest to the identification of the food origination.

On weight control concerns regarding the food of choice student's motives changed from the increased in overall food consumption and the consumption of junk food during COVID [37] to the food that which primarily helps controlling their weight, and secondarily with balanced calories and fat content.

On mood and stress concerns students are leaving behind the COVID effect related to depression, stress and anxiety common to all adults [38], choosing food which helps them to cope with their life better, to keep them awake in a cheerful mood.

On familiarity concerns which helped adult consumers to select the food they know and trust during the pandemic [39], students are now less motivated with familiarity parameters such as being familiar with the food. and eating what they usually eat or remembering their childhood.

Price remains the most important food choice motive for students today, as it was before and during the pandemic [40,41]. They are very much interested with positive motives exceeding 80% the food they choose to have a price "value for money", not expensive, and cheap if possible.

On shopping frequency and behavior motives students have returned to their choices before the pandemic compared to their choices with the COVID-19 lockdown period which included decrease

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in shopping frequency, increase in online purchase and delivery [42,43]. They are now purchasing their food with almost equal preferences from supermarket, local market, online, and delivery, purchasing the food one per week or per two weeks. One specific motive which changed within the pandemic [25,44] and continues to be top in the preference of students too is the cooking at home as a full meal and not as a fast food. Eating at a restaurant continues to be lower at the student's motives. Finally, it is quite interesting the fact that while students are very much interested in the value for money actual price of the food, they are not equally concerned about the value for money actual commodity of the food.

## 4. Conclusions

Our data presented above indicate that FCM of college students beyond the COVID-19 pandemic are returning to the pre COVID-19 choices with the changes in motives recorded during the pandemic slowly disappearing. Price remains the most important factor for the purchase of food, a motive which was always at the top of the selection criteria before and after the pandemic. The only motive which has changed positively due to the lockdown and continues as such even for students is the cooking of full meals at home, avoiding the visits at restaurants. The lack of exercises and the choice for junk foods has now changed to healthy quality food choices as it was before the pandemic, with significant attention again to nutritional quality, weight control concerns, environmental impact, , familiarity, and good mood of the food.

The constrains of the study include most female participants which is however common for many related studies. Furthermore, the Greek nationality college students only is a limitation, and more studies in other countries with similar questionnaire should be performed to assess the global validity of the findings. Another limitation of the study is that it has been conducted one year after the termination of the pandemic, with more studies required in the two and three years after in order to have an overall assessment of the findings.

The results should be used by the food industry and the food service providers as a basic guideline for the market of the young generation aged 20 to 30 years old. It is also useful for the industry in general because it gives a first indication of the adults future prospects when these today college students will be older and part of the mainstream working force.

**Supplementary Materials:** The following supporting information are included Table S1: Questionnaire on FCM, Table S2: Associations between students' motives on food consumption regarding health, sensory appeal, nutritional quality and ethical concerns on and the sociodemographic variables, and Table S3: Associations between students' motives on food consumption regarding weight control, mood and stress, familiarity, price and shopping frequency and behavior and the sociodemographic variables.

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