# CONSUMERS' PROFILE ANALYSIS FOR CHICKEN MEAT, DURING THE FIRST WAVE OF COVID-19 PANDEMIC: CASE OF NORTHERN GREECE

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**ABSTRACT.** During the years of 2015–2016 in Greece, an increase of imports of poultry meat has been occurred on a level of 10.2%, whereas in the years of 2018–2019 the increase has only reached the level of 1.9%. On the contrary, a reduction on a level of 14.2% on poultry meat imports, in Greece, between the years of 2019–2020 have shown the possible implications of the COVID-19 pandemic to poultry meat consumption and possibly to chicken meat consumption. Moreover, the Food related lifestyle (FRL) can be defined as a system of consumers' cognitive categories and relationships that connect a set of food-related behaviours, with a set of personal values of each consumer. Hence, this paper aims to segment Greek consumers according to their food-related lifestyles values and is tried to identify the aspects that may determine consumers' behaviour towards chicken meat preference, during the first wave of the COVID-19 pandemic. Four consumer segments appeared: "Sociable and safety seekers", "Light concerned and cooks", "Unconcerned and price seekers", "Innovative and moderate concerned". Uni- and multivariate statistical techniques have been used. Consumers' profiles that demonstrated different food-related attitudes towards the pandemic were analysed with the use of variables: gender, age, marital status, educational level, monthly income and chicken meat quality cues. Significant differences were found between the four segments in terms of gender, age and income. Moreover, "Light concerned and cooks" and "Innovative and moderate concerned" consumers revealed to consider the place of purchasing as a dominant extrinsic quality cue of chicken meat. Furthermore, these consumers appeared to trust butcher in terms of the safety of chicken meat that they purchased, whereas only the consumers of the segment of "Light concerned and cooks" showed a willingness to pay a higher amount for chicken meat that is produced by animal welfare standards.

## Introduction

In an ever-changing world, diverse and different consumer eating preferences are causing trends in meat consumption (Grunert, 2006). Particularly in the western world, the consumers' consumption of meat has changed in the last decade, due to their socio-economic changes, ethical concerns, religious beliefs, tradition, or dietary scandals (Font-i-Furnols Guerrero, 2014). Since the meat market and its products are shaped through unexpected, complex and rapid changes which are caused by nutritional, economical and health events (Henchion *et al.*, 2014), meat production and consumption usually, create several controversial issues that concern consumers (Verbeke *et al.*, 2015). Thus, even though the meat has been recognized as a fundamental element of a human's diet, both from biological and social perspectives (Leroy, De Smet, 2019), nowadays, meat consumption and production have been regarded as problematic by consumers, due to health and safety issues, together with the animal welfare and environmental consumers' concerns (Vinnari, Tapio, 2009). On the other hand, the media attention to food scandals can change the time disclosure of a food incident and

subsequently might affect the consumers' behavioural response (Rieger *et al.*, 2016). Consequently, consumers' preferences for meat are complex and alter due to different situations (Verbeke *et al.*, 2015).

Historically, meat was treated as a food that promotes health and gives energy to the consumer (Chong *et al.*, 2009). Moreover, western societies still consider meat as an important part of their culture (Latvala *et al.*, 2012), whereas it can be usually identified through the psychological dimension of human's habitual eating, or as a bonding effect in a community, and as a need for differentiation in the human's social hierarchical scale (Leroy, Praet, 2015). But during the time, and especially halfway of the twentieth century, meat's positive image has been altered by negative consumers' perceptions (Leroy, De Smet, 2019) and meat consumption has been tended to be rather controversial for consumers (Latvala *et al.*, 2012). Specifically, the consumer's negative perception is focused on the consumption of red meat, which has been associated with chronic human diseases and cancer (Leroy, De Smet, 2019). In contrast, a negative health-compromising effect of white meat consumption, mainly derived from poultry meat, hasn't been reported yet, nor chronic diseases have ever been reported in the scientific literature (Marangoni *et al.*, 2015). However, there have been studies indicating a rather health-protective effect, due to white meat consumption, such as the protective effect of chicken meat consumption against age-related macular degeneration (Chong *et al.*, 2009).

Thus, human diseases related to the increasing lifestyle, such as diabetes which is associated with obesity as a function of a poor diet and a sedentary lifestyle, have led consumers to shift towards the consumption of chicken meat as a healthier option, due to its less fat and cholesterol content (Ripoll *et al.*, 2015). Moreover, chicken meat in developing markets has been considered as a value-oriented food, since it is identified as a cheap choice, has no religious restrictions and satisfies the consumer's need for new experiences through convenience packages or ready to eat meals (Michel *et al.*, 2011b). But chicken meat is also associated with foodborne illness, such as campylobacteriosis (Bearth *et al.*, 2014) and poultry diseases such as avian influenza, that may lead to a possible economic loss in the food market and more dramatic, to human losses, according to the severity of the disease infection and the immediate public response (Kraipornsak, 2010). Despite the chicken's meat safety issues, it is regarded as one of the best sources of animal protein and is usually chosen by low-income consumers, because it is an affordable and accessible source of protein with low-fat content and limited religious restrictions (Tan *et al.*, 2018).

Therefore, chicken meat could be considered as one of the most globally consumed meat (Wen *et al.*, 2019), since, according to the Food and Agriculture Organization (FAO), poultry meat represented about 39% of global meat production in 2019. The FAO recognizes China as the world's largest poultry meat producer followed by USA and Brazil. Whereas, in the European Union (EU) between the years of 2010–2018, a cumulative rise of about one quarter (3.3 million tonnes of poultry meat) has occurred despite avian influenza's cases in the several EU Member States (Eurostat, 2019). Moreover, the statistical analysis of the Hellenic Statistical Authority shows that Greek poultry meat production has increased throughout the years 2011–2019. Specifically, the total poultry meat production, in the year 2011 was 175.23 thousand tonnes and raised to 230.0 thousand tonnes in the year 2019. However, the total poultry meat production cannot satisfy the Greek domestic consumption since the self-sufficiency is on a level of 65–70%, leading to poultry meat imports. Thus, almost 84 thousand tonnes of poultry meat imported in Greece, in the year 2019, representing an increase of 1.9% in the total amount of poultry meat imports between the years 2019–2018, whereas in the years 2015–2016 in Greece, the increase of poultry meat imports was on a level of 10.2%.

All the above are witnessed the importance of chicken meat consumption in the meat sector. Therefore, there is a lot of research concerning the factors that affect chicken meat consumption. Specifically, a lot of research is focused on the evaluation of the consumer's behaviour that contributes to the understanding who is the consumer in the market area, what the decision-making process is and what influences (socio-economical and psychological) (Lantos, 2015) may lead him to the final purchase food choice. Thus, consumers can be motivated to consume chicken meat:

a) according to their perceptions of chicken meat quality, and or healthiness and nutritional value (Kennedy *et al.*, 2004; Krystallis *et al.*, 2007; Michel *et al.*, 2011b; Kuttapan *et al.*, 2012; Imran *et al.*, 2014; Naspetti *et al.*, 2015; Samant, Seo, 2016; Skunca *et al.*, 2017; Djekic *et al.*, 2018);

b) according to their perceptions of its sensory characteristics, like taste, colour, freshness (Kennedy *et al.*, 2005; Sismanoglou, Tzimitra-Kalogianni, 2011; Pirvutoiu, Popescu, 2013; Walley *et al.*, 2014; Walley *et al.*, 2015; Raimundo, Batalha, 2015; Predanocyová *et al.*, 2019);

c) according to its nutritional superiority over the red meat and that it can be treated as a health benefits food *e.g.* delay in the appearance of macular degeneration (Chong *et al.*, 2009; Jaturasitha *et al.*, 2016; Kulprachakarn *et al.*, 2017), or as functional food (Shan *et al.*, 2017);

d) according to their animal welfare concerns (Hall, Sandilands, 2006; Vukasovič, 2009; Tsakiridou *et al.*, 2010; Pouta *et al.*, 2010; Toma *et al.*, 2011; De Jonge, Van Trijp, 2014; Van Loo *et al.*, 2014; Lassoued *et al.*, 2015; Thaxton *et al.*, 2016; Vanhonacker *et al.*, 2016; Erian, Phillips, 2017; Mulder, Zomer, 2017; Vukasovič, Stanton, 2017; Otieno, Ogutu, 2019);

e) according to their perceptions of chicken rearing systems or chicken breeds, such as slow growth chickens, that may affect the overall quality of chicken meat (Tuyttens *et al.*, 2015; Naspetti *et al.*, 2015; Jaturasitha *et al.*, 2016; Devatkal *et al.*, 2019);

f) according to their demographic characteristics and their general purchasing habits for chicken meat consumption (Kennedy *et al.*, 2005; Krystallis, Arvanitoyannis, 2006; Sismanoglou, Tzimitra-Kalogianni, 2011; Pirvutoiu, Popescu, 2013; Sahin *et al.*, 2013; Walley *et al.*, 2014; Raimundo, Batalha, 2015; Ripoll *et al.*, 2015; Walley *et al.*, 2015; Skunca *et al.*, 2017; Predanocyová *et al.*, 2019);

g) according to their perceptions of health and safety issues that are usually associated with chicken meat consumption, such as dioxins, campylobacteriosis, salmonella, avian influenza (Kraipornsak, 2010; Bearth *et al.*, 2014; Rieger *et al.*, 2016; Siettou, 2016; Zhou *et al.*, 2016; Clark *et al.*, 2019; Hessel *et al.*, 2019; Wen *et al.*, 2019; Zhang *et al.*, 2019);

h) according to their trust in the quality label, in the country of origin, or the place of sale (butcher shop) (Kennedy *et al.*, 2004; Krystallis *et al.*, 2007; Michel *et al.*, 2011a; Sismanoglou, Tzimitra-Kalogianni, 2011; De Jonge, Van Trijp, 2014; Heerwagen *et al.*, 2015; Lassoued *et al.*, 2015; Samant, Seo, 2016; Vanhonacker *et al.*, 2016; Vukasovič, Stanton, 2017; Kehagia *et al.*, 2017; Lusk, 2018);

i) according to their food-related lifestyle (Ripoll *et al.*, 2015; Escriba-Perez *et al.,* 2017; Wongprawmas *et al.*, 2018S).

Nowadays the outbreak of coronavirus 2019 (COVID-19) pandemic has caused dramatic changes in human patterns due to its health and economic problems (Safara, 2020). The consumers' purchasing power, especially after the first wave of the COVID-19 pandemic, together with the increased feeding costs and the prices of raw ingredients may affect negatively the growth of the poultry industry (Hafez, Attia, 2020) and consequently the chicken meat consumption. Specifically, in Greece between the years of 2019 and 2020, due to COVID-19 restrictions, together with the restrictions on tourism which caused a lower summer meat consumption (7.37 million tourists arrived in Greece in the year 2020 whereas, in 2019, 31.3 million tourists arrived), poultry meat imports reduced on a level 14.2% (Pramantiotis, 2021). Moreover, the European poultry meat sector has been significantly affected by the COVID-19 crisis, mainly in terms of consumption. Thus, in March 2020 an increase in demand for poultry meat in retail (+20%) has occurred while the overall consumption levels in the foodservice sector fell since this sector was forced to close down. Usually, the foodservice sector absorbs poultry meat production. Hence, European poultry slaughterhouses ordered 10–30% fewer chickens for slaughter at that period (Pramantiotis, 2021).

All the above contribute to the fact that food consumers' choice, and particularly meat choice, although it seems a simple process, has nevertheless been described as a complex consumers' behaviour which is influenced by a variety of factors that interact with each other (Hamlin, 2016). Its complexity lies in the fact that, at a given moment, the food choice is determined by an interaction of factors related: a) to the personal characteristics of the consumer, b) to the food itself (internal and external characteristics of the food) and c) to the consumer's environment (Marian, Thøgersen, 2013). Moreover, the quality evaluation of meat is considered a dominant factor influencing consumers' food purchasing intention (Papanagiotou *et al.*, 2013).

Consequently, personal influences of each consumer, together with the factors that affect meat consumption as well as the consumer's lifestyle towards the food, may contribute to shaping the consumer's behaviour towards meat (Predanocyová *et al.*, 2019) and chicken meat particular. A food-related lifestyle, FRL, is defined as a system of consumer's cognitive categories and relationships that connect a set of food-related behaviours, with a set of personal values of each consumer (Brunsø *et al.*, 2004). These consumer's cognitive structures are reflected by five dimensions, namely: a) purchase motives (*e.g.* self-realization), b) consumption situations (*e.g.* eating at home), c) cooking methods (*e.g.* cooking at home), d) ways of shopping (*e.g.* shopping in specialized stores), and quality aspects (*e.g.* healthy food, taste) (Grunert, 2006; Szakály *et al.*, 2012; Escriba-Perez *et al.*, 2017). The FRL instrument has been developed and tested in several European countries in terms of its intercultural validity, while, it has been proven stable over time and has been used for the application of Pan-European food consumer segments, particularly in meat preference (Scholderer *et al.*, 2004; Brunsø *et al.*, 2004; Grunert, 2006; Bernués *et al.*, 2012; Szakály *et al.*, 2012; Ripoll *et al.*, 2015; Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017; Wongprawmas *et al.*, 2018). Thus, the food-related lifestyle (FRL) construct has been proposed as one of the best segmentation tools in the food sector (Grunert, 2019). Moreover, health consumers' concerns and sociodemographic features have been proved the main factors influencing consumers' behaviour towards meat consumption (Escriba-Perez *et al.*, 2017) and consequently chicken meat consumption. Furthermore, the perceived quality that is combined by intrinsic and extrinsic cues of meat is influenced by the subjectivity of the consumer and affects the final purchasing decisions (Henchion *et al.*, 2014).

Also, the Greek's market self-deficiency of poultry meat production together with the high poultry meat imports in 2019 has indicated the importance of poultry meat in the Greeks' diet. Despite the importance of poultry meat consumption, the availability of research on Greeks consumers' preferences and habits, particularly as regards chicken meat, is limited (Krystallis,

Arvanitoyannis, 2006; Krystallis *et al.*, 2007; Tsakiridou *et al.*, 2010; Sismanoglou, Tzimitra-Kalogianni, 2011; Kehagia *et al.*, 2017), and to the best of our knowledge, no published research has used the FRL approach on the meat consumption of Greeks consumers. Furthermore, the social distancing and the advice on self-isolation due to the virus pandemic may have pronounced implications to meat consumption (Nicola *et al.*, 2020) and possibly to chicken meat consumption, as the reduction of poultry meat imports in Greece between the years 2019 and 2020, has shown.

Therefore, this study aims to fill these gaps by investigating Greeks' consumers' behaviour towards chicken meat consumption on the first wave of the COVID-19 pandemic with the use of the FRL model. It is focused on the segmentation of Greek consumers based on their food-related lifestyles and is tried to identify the aspects that may determine consumers' behaviour towards chicken meat during that period. In addition, the present survey has the following objectives: a) to identify the consumers' segments, after the first wave of COVID-19 pandemic, according to their food-related lifestyle values, b) to determine the consumers' profiles by different sociodemographic variables, and c) to identify which extrinsic quality cues of chicken meat affect the consumers' segments, after the first wave of COVID-19 pandemic.

## Material and Methods

### Study area and data collection

The present survey was conducted in two phases, the qualitative survey and the quantitative one. The qualitative survey included 43 consumers who were interviewed by the method of in-depth interviews in the period of December 2018 to January 2019, one year before the pandemic. The motivation of the qualitative study was derived from the fact that chicken meat consumption in Greece has pointed to high demand through the years, while there was limited scientific evidence that studied chicken meat consumption in terms of consumers' behaviour. The quantitative survey was conducted after the lifting of the restrictive measures due to the pandemic, from June to September 2020, in the urban complex of Thessaloniki. The survey's sample has consisted of 689 consumers yielding an error of 2.76% with a confidence level of 95%. Besides, the least suitable size sample for consumers' behaviour research is considered 500 consumers (Zafeiropoulos, 2005). The sample size was determined by Stathakopoulos (2005) mathematical relation [$n = \frac{z^2(p(1-p))}{e^2}$, for 95% confidence level and an error of 2.76%, p = analogy of consumers (from a preliminary study) in a specific chicken attribute, *e.g.* purchasing chicken meat at least once a week, 1–p = analogy of consumers (from a preliminary study) without the specific chicken attribute, *e.g.* purchasing chicken meat less than once a week]. The afore-mentioned mathematical relation is used since a large number of Thessaloniki's population simplifies all

other mathematical relations (Siardos, 2005) to Stathopoulos's one. The census data of 2011 by the National Statistical Service of Greece has been used for the determination of the size of consumers' sample of each Thessaloniki's region. Consumers aged from 18 to >75 years old. Random stratified, by region, sampling was used. The consumers selected from various points of chicken meat sale, such as supermarkets, butchers, restaurants, fast food outlets, at various hours during the day and all days of the week, in the city of Thessaloniki. At that period, due to the COVID-19 pandemic, there was strong advice on social distancing. Therefore, each respondent completed the questionnaire with the proper guidance, while each questionnaire was answered after the respondent's oral statement that he/she was personally responsible for purchasing chicken meat in and out of the home. Thus, the consumers in the present study were the end-users that form the final chicken meat chain.

### Questionnaire and Variables

The structured questionnaire was designed according to the literature mentioned in the Introduction regarding chicken meat researchers, as well as the results from the qualitative phase. Specifically, the qualitative questionnaire was divided into six thematic sections that they included: i) the attitudes of consumers towards the purchase of chicken meat, ii) the attitudes regarding the consumption of ready-cooked chicken, iii) consumers' perceptions towards the quality of chicken meat, the information and safety of the food, iv) consumers' perceptions towards price, v) consumers; beliefs towards rearing systems and vi) consumers' perceptions towards packaging and labelling.

The questionnaire of the quantitative study was structured in three parts: 1) safety and quality perception towards chicken meat 2) food-related lifestyle and 3) consumer and household characteristics. The variables that were examined to profile consumers were their sociodemographic variables, the questions of the food-related lifestyle (FRL) and the perceived quality cues of chicken meat.

As stated in the Introduction, the full version of the FRL construct with 69 questions (Brunsø *et al.*, 2004) including in its five dimensions, has already been tested for its validity in several segmentation studies. Therefore, a reduced version of the FRL model is preferred in this study to segment and profile consumers. Furthermore, its reduced version would not overload the respondents with many questions. Moreover, the FRL model can include a different number of items, so that each of them may effectively capture the various dimensions of consumer's lifestyle (Scholderer *et al.*, 2004; Buitrago-Vera *et al.*, 2016). The present FRL instrument included 20 questions regarding the aspects of food life culture (Scholderer *et al.*, 2004) and the pandemic situation.

According to previous researchers (Liang, 2014; Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017) 5-point Likert scale has been preferred in the conduction of the FRL model. Therefore, the questions

of the food-related lifestyle were measured on a 5-point Likert scale ranging from 5 "strongly agree" to 1 "strongly disagree" and there was a neutral midpoint at 3 "neither agree nor disagree". A missing data value of 16 cases, concerning the lifestyle questions, was identified after the collection of the data. Since the missing values were fewer than 10% of the total responses, we assumed that these cases were representatives of the random missing values (Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017). Therefore, they were removed and 673 valid cases remained.

### Statistical analysis

The survey's data were analysed with IBM SPSS Statistics version 25 (IBM Corp., 2017), and uni- and multivariate statistical techniques have been used. Descriptive statistics were applied for the description of Greek consumers in terms of their sociodemographic characteristics and terms of their food-related lifestyle perceptions. Then multivariate analysis was employed to reduce the 20 items related to the FRL model by the use of exploratory factor analysis. The combination of factor and cluster analysis was preferred for the definition of food-related lifestyle segments (Liang, 2014; Ripoll *et al.*, 2015; Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017; Wongprawmas *et al.*, 2018; Kumar, Smith, 2018 ).

At first, principal component analysis (PCA) based on factor analysis was applied for defining the dimensions that could describe the consumers. Bartlett's sphericity test and the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) were used aiming the minimal information or item loss (Escriba-Perez *et al.*, 2017). Afterwards, a cluster analysis method was applied, to group the consumers according to the previous dimensions. The cluster analysis method was divided into hierarchical and non-hierarchical (Szakály *et al.*, 2012). The use of the two-stage clustering method has been recommended to overcome the limitations that can be occurred by hierarchical and partitioning clustering procedures (Kumar, Smith, 2018). Firstly, cluster analysis using hierarchical procedures based on Ward's method was applied to identify the number of clusters. Then, non-hierarchical K-Means cluster analysis was performed to classify the samples into clusters.

The final clusters have been evaluated according to the sociodemographic variables and tested for differences in attitudes towards using chi-square and one-way ANOVA analysis.

The reliability of the values dimensions and clusters was assessed by Cronbach's alpha. This study used 0.6 as the acceptable threshold, as suggested by Siardos (2005) together with similar food-related lifestyle studies (Liang, 2014).

## Results and Discussion

### Descriptive statistics of the sample

The results from the qualitative phase revealed that consumers seemed to search mainly for "nutritional value" and "convenience" on their chicken meat consumption, while the main criteria of chicken meat purchasing were the "quality" and the "country of origin". However, the purchase criteria varied according to the type of chicken meat they consumed (bulk, cooked and packaged). Moreover, the preferred quality chicken meat attributes were the "colour and the flavour" while the "butcher" is considered the main credence quality chicken meat attribute, as 37.8% of consumers stated that "the butcher supplied them with safe", "fresh" and "properly prepared for cooking meat". The price of chicken meat is considered "low" and the label that indicated the "quality control" as well as "the dates of production – slaughter" was the most important label information. It is noteworthy that the majority of the consumers argued that they are not interested in knowing the welfare conditions in which the chicken they consume has been bred, since they didn't trust the provided information label. However, the majority of the respondents trusted the information that is provided by the University and government agencies of control.

Moreover, the results of the quantitative appeared as follow:

Table 1 summarises that the gender of the consumers were 61.8% females and 38.2% males. Since the respondents have been asked whether they were purchasing chicken meat before answering the survey's questions, this imbalance was likely to have occurred. This is caused to the fact that chicken meat consumption is usually considered a female preference (Kennedy *et al.*, 2004; Sismanoglou, Tzimitra-Kalogianni, 2011; Raimundo, Batalha, 2015; Ripoll *et al.*, 2015). Moreover, food purchasing and preparation are usually regulated by women (Tsakiridou *et al.*, 2010; Liang, 2014). The most common age ranged to 46–55 years old (36.6%), followed by the age of 36–45 (26.1%) and the age of 26–35 (12.2%). Most of the consumers were married 63.2% and the majority of the respondents had no children at home, in a percentage of 44.9%, whereas the 53.0% of the consumers stated that they had two adults in their household. Moreover, the survey's results revealed that chicken meat respondents were highly educated, as the majority of them possessed at least a university degree in a percentage of 56.3%. This result may be related to the fact that these consumers were more willing to answer the questions. In addition, the most common monthly income ranged from 1001 to 1500 euro (37.1%), followed by the monthly income of 501–1000 euro (25.6%). The descriptive statistics for the sociodemographic variables of the sample are presented in Table1.

**Table 1.** Participants 'sociodemographic characteristics (%)

| Variable | Level | Percent |
|---|---|---|
| Gender | Men | 38.2 |
| | Women | 61.8 |
| Age | 18–25 | 8.9 |
| | 26–35 | 12.2 |
| | 36–45 | 26.1 |
| | 46–55 | 36.6 |
| | 56–65 | 10.6 |
| | 66–75 | 4.9 |
| | >75 | 0.7 |
| Marital status | Married | 63.2 |
| | Single | 20.4 |
| | Divorced | 13.7 |
| | Widow | 2.7 |
| Educational level | Primary | 3.3 |
| | Intermediate | 40.4 |
| | Advanced | 56.3 |
| Monthly respondent's income, euro | ≤500 | 12.1 |
| | 501–1000 | 25.6 |
| | 1001–1500 | 37.1 |
| | 1501 | 25.2 |

Table 2 demonstrates the descriptive statistics for the items measuring food-related lifestyles. The majority

of the items depicted the consumers' agreement. The items that received the most strongly, agreement of the consumers' perceptions were: "Eating is an enjoyment" and "I check the expiration dates of food products", followed by the items "I prefer to buy natural products without preservatives" and "I like to cook for me, my family and my friends". Some food values that appeared in Table 2 depicted a trend on efficient food purchasing as it was also supported in the study of Buitrago-Vera *et al.* (2016). Furthermore, the items that assembled the lower scores were: "After the pandemic, I don't trust the takeaway food", "I find cooking tiring", and "After the pandemic, I prefer not eating out". Hence, the food values that seemed to be associated with the pandemic revealed that consumers in cases of emergencies tend to behave with an "illusion of control" since they try to manage a world that they can't control, as Wang *et al.* (2020) noted. Moreover, cooking was found to be a pleasurable activity (Escriba-Perez *et al.*, 2017).

**Table 2.** Descriptive statistics for the items measuring food-related lifestyle

| Item | Average | SD |
|---|---|---|
| I always make a list, before I go shopping for food | 4.04 | 1.03 |
| I like shopping for food for me or my family | 4.39 | 0.77 |
| I like shopping and tasting gourmet foods | 3.51 | 1.06 |
| Eating out with my friends or with my family is an important part of my social life | 4.01 | 0.92 |
| Eating is an enjoyment | 4.40 | 0.76 |
| I try to schedule the weekly menu, so as not to waste time and money | 3.81 | 1.00 |
| I like to read the labels of the food products that I buy to know what they contain | 3.95 | 0.90 |
| I like to cook for me, my family and my friends | 4.07 | 1.01 |
| I check the prices and compare them | 4.01 | 0.93 |
| I check the expiration dates of food | 4.40 | 0.81 |
| I read recipes and experiment in cooking | 3.58 | 1.09 |
| Members of my family like to involve in cooking | 3.46 | 1.09 |
| I prefer to buy products firstly for their nutritional value and then for their taste | 3.53 | 1.11 |
| I prefer to buy natural products without preservatives | 4.16 | 0.91 |
| At home, I eat take away food, at least once a month | 3.49 | 1.28 |
| After the pandemic, I prefer not to eat out | 2.82 | 1.26 |
| I find cooking tiring | 2.79 | 1.23 |
| After the pandemic, I pay attention to the places from where I buy food (cleanliness, without overcrowding) | 3.66 | 1.16 |
| After the pandemic, I don't trust the takeaway food | 2.73 | 1.19 |
| I use the internet to inform me and to entertain me | 3.95 | 1.01 |

### Multivariate analysis
#### *Dimensions and reliability analysis*

Factor analysis using principal component (PCA) was performed for the reduction of 20 items regarding the questions on FRL. PCA with varimax rotation was employed on this data.

The test KMO measures the sampling adequacy and received the value of 0.750 which is considered a good value since it was higher than an acceptable value of 0.50 (Siardos, 2005; Liang, 2014; Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017). Moreover, in this study, Bartlett's sphericity test is considered statistical acceptable, since the adequacy of the factor analysis, was yielding a p-value of 0.000 at a significance level of 0.05 (Escriba-Perez *et al.*, 2017). Therefore, the factorability of the correlation matrix was achieved (Wongprawmas *et al.*, 2018). The reliability of the axis values was 0.746 and it was assessed by Cronbach's alpha. In this study, it is considered to be acceptable, since it was higher than the acceptable threshold of 0.6

(Siardos, 2005; Liang, 2014; Kumar, Smith, 2018). Maximum variation was employed for the examined dimensions and the extracted factors were eigenvalues larger than one, whereas items and dimensions with factor loadings lower than 0.5 (Liang, 2014) were not concerned.

The factor analysis yielded six factors that explained 59.29% of the total variance. This result is considered acceptable as according to Buitrago-Vera *et al.* (2016) a variance value of 60% or even less is considered acceptable in the social sciences. The six factors are demonstrated in Table 3 and compliance with the relevant literature (Szakály *et al.*, 2012; Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017; Wongprawmas *et al.*, 2018) are identified as: i) "Nutritional value and innovation", ii) "Food security after the first wave of the pandemic", iii) "The role of food in social life", iv) "Ways of shopping", v) "Planned consumption and enjoyment", and vi) "Love for cooking".

**Table 3.** Matrix of rotated components in factor analysis

| | Factors | | | | | |
|---|---|---|---|---|---|---|
| | Nutritional value and innovation | Food safety after the first wave of the pandemic | The role of food in social life | Ways of shopping | Planned consumption and enjoyment | Love for cooking |
| I prefer to buy products firstly for their nutritional value and then for their taste | 0.756 | | | | | |
| I like shopping and tasting gourmet foods | 0.630 | | 0.443 | | | |
| I prefer to buy natural products without preservatives | 0.621 | | | | | |
| Members of my family like to involve in cooking | 0.498 | | | | | |
| I like to read the labels of the food that I buy to know what they contain | 0.469 | | | 0.458 | 0.313 | |
| After the pandemic, I don't trust the takeaway food | | 0.843 | | | | |
| After the pandemic, I prefer not to eat out | | 0.809 | | | | |
| After the pandemic, I pay attention to the places from where I buy food (cleanliness, without overcrowding) | | 0.702 | | | | |
| Eating out with my friends or with my family is an important part of my social life | | | 0.725 | | | |
| Eating is an enjoyment | | | 0.661 | | | |
| At home, I eat takeaway food, at least once a month | | | 0.640 | | | |
| I use the internet to inform me and to entertain me | | | 0.497 | 0.367 | | |
| I check the prices and compare them | | | | 0.754 | | |
| I check the expiration dates of food products | | | | 0.638 | | |
| I like shopping for food for me or my family | | | | | 0.741 | |
| I always make a list, before I go shopping for food | | | | | 0.737 | |
| I try to schedule the weekly menu, so as not to waste time and money | | | | 0.361 | 0.539 | |
| I find cooking tiring | | | | | | –0.799 |
| I like to cook for me, my family and my friends | 0.301 | | | | | 0.683 |
| I read recipes and experiment in cooking | 0.397 | | | | | 0.680 |

Underlined values indicate factors loading ≥0.5

The first factor is described as "Nutritional value and innovation" and explained 21.2% of the total variance whereas high loads (over 0.621) showed three of the seven subjects. This factor contained variables regarding consumers' preferences of healthy, nutritional food as well as innovative ones, such as gourmet food (Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017). The second factor is labelled "Food safety after the first wave of the pandemic" and explained 11.74% of the total variation with charges being over 0.702. This factor accumulated variables regarding the consumers' concerns on safe food consumption after the pandemic by selecting places that were not crowded and not trusting convenience food or eating out. The third factor is classified as "The role of food in social life" and explained 8.20% of the total variation with charges over 0.640. It is related to variables that depicted the role of food in the social life of consumers together with their enjoyment of eating. The fourth factor, which explained 6.57% of the total variance and loaded on 2 subjects over 0.638 is identified as "Ways of shopping". It collected variables that showed the consumers' interest in food pricing and food safety by the use of expiration date. The fifth factor is characterised as "Planned consumption and enjoyment", explained 6.16% of the total variance, and loaded on three subjects over 0.539. It is assembled variables that indicated the importance of planning in terms of food shopping as well as the family meals. It is also included the enjoyment from the activity of food shopping. The sixth factor is labelled "Love for cooking" and explained 5.44% of the total variation with charges at 2 issues above 0.680. The variables of this factor expressed the consumers'

preference for cooking and their willingness for cooking experimentation.

### Consumers' profiles after the first wave of pandemic towards chicken quality cues

The segments are estimated by the procedure of hierarchical cluster analysis. The clusters were obtained by Ward's method with the use of squared Euclidean distance that was applied to measure the similarity between the items. Four clusters were determined by the use of a non-hierarchical K-means clustering. Following the regularity test, the one-way ANOVA analysis was applied to investigate the possible differences between the four consumer segments with the six factors that are resulted from the factorial analysis of main components. These results are illustrated in Table 4. According to the items that yielded the clusters, and in compliance with the relevant literature (Krystallis, Arvanitoyannis, 2006; Krystallis *et al.*, 2007; Bernués *et al.*, 2012; Ripoll *et al.*, 2015; Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017; Kumar, Smith, 2018; Wongprawmas *et al.*, 2018) the final food consumer segments were labelled as: "Sociable and safety seekers", "Light concerned and cooks", "Unconcerned and price seekers", "Innovative and moderate concerned". Analytically:

i) The "Sociable and safety seekers" segment represented 26.8% of the total sample size (n = 180). It is comprised of the only group of consumers that have depicted high food safety concerns due to the COVID-19 pandemic. These consumers, due to the pandemic, manifested a strong alteration in their eating habits than the other segments. Thus,

they preferred not eating out, not purchasing convenience food and they avoided crowded food places after the pandemic. Although this segment was the only one that was characterised by consumers who regarded food as a dominant element in their social life, since they found eating an enjoyable activity, they preferred out of home consumption and purchasing convenience food. Furthermore, they indicated strongly preference than the segments of "Light concerned and cooks" and "Unconcerned and price seekers" for purchasing natural, innovative and nutritional food, but they showed no interest in pricing and labelling in terms of expiration dates, but greater than the segment of "Light concerned and cooks". Moreover, this segment evaluated shopping and cooking as a pleasant activity more than the segment of "Innovative and moderate concerned". Finally, this segment is determined by consumers who searched for food quality cues in terms of its nutritional value, and who have strongly switched their food consumption behaviour, due to the COVID-19 pandemic, even though the food was strongly regarded by its social aspect.

ii) The "Light concerned and cooks" segment represented 10% of the total sample size (n = 67). It included consumers who illustrated a more rational behaviour in food purchasing by planning the purchasing household food and the weekly meals and revealed light food safety concerns due to pandemics, but more than the "Unconcerned and price seekers" consumers reveal. This might have derived from the fact that this segment had less interest of all segments of eating out and purchasing convenience food. Moreover, this was the only consumers' segment that strongly evaluated shopping as a pleasant activity maybe because it involved purchasing for their family members.

Thus, this segment indicated an interest in cooking as a social act and experimentation, while it showed less interest than the segment of "Innovative and moderate concerned" consumers towards the nutritional value of the food. Additionally, the occurrence of the pandemic had a light effect in this segment while food-related aspects did not comprise a social component.

iii) The "Unconcerned and price seekers" segment was the second largest one with 30.6% of the total sample size (n = 206). This segment was the only one with the least consumers' concerns on the COVID-19 pandemic. However, the consumers' values regarding food consumption by its social aspect, were higher than those of "Light concerned and cooks" and "Innovative and moderate concerned" segments. Thus, light changes in their eating habits after the pandemic might derive from the fact that food consumption is considered by these consumers a fulfilment act. Furthermore, it included consumers who illustrated a more rational behaviour in food purchasing by planning the schedule of household week meals and they indicated an interest in cooking as a social act and experimentation maybe because it involved purchasing and cooking for their family members, while they had no interest and less than the segment of "Sociable and safety seekers" towards the nutritional value of food. Finally, the minimal concerns regarding food safety aspects since the scare of a pandemic might, also, derived, from the fact that this segment was the only one in comparison to others that showed a high preference for extrinsic quality cues, such as price and food labels regarding expiration dates. Therefore, price and freshness might be strong food attributes that lead to their eating habits.

**Table 4.** Classification and differences of the sample's clusters

| Factor | Cluster | | | | F value | Scheffe comparison |
|---|---|---|---|---|---|---|
| | Sociable and safety seekers | Light concerned and cooks | Unconcerned and price seekers | Innovative and moderate concerned | | |
| Nutritional value and innovation | 0.39748 | −0.66747 | −0.54884 | 0.39198 | 660.376 | (1) > (2), (1) > (3), (2) < (4) |
| Food safety after the first wave of the pandemic | 0.79598 | −0.06806 | −0.62227 | −0.04786 | 900.919 | (1) > (2), (1) > (3), (1) > (4), (2) > (3) |
| The role of food in social life | 0.68582 | −0.65716 | 0.23338 | −0.57952 | 930.622 | (1) > (2), (1) > (3), (1) > (4), (2) < (3) |
| Ways of shopping | −0.04882 | −10.7111 | 0.57741 | 0.02037 | 1450.523 | (1) > (2), (1) < (3), (2) < (4), (2) < (3) |
| Planned consumption and enjoyment | 0.24861 | 0.40843 | 0.35743 | −0.66248 | 610.449 | (1) > (4), (2) > (4) |
| Love for cooking | 0.25434 | 0.22832 | 0.10534 | −0.37626 | 170.373 | (1) > (4), (2) > (4) |
| Cluster size | 180 | 67 | 206 | 220 | | |

p < 0.001, the cluster means are based on factor scores

iv) The "Innovative and moderate concerned" segment was the largest one and represented 32.7% of the total sample size (n = 220). It showed moderate concerns due to the pandemic. This might have derived from the fact that these consumers had no interest in food consumption in terms of social activity. Thus, as the food did not place a dominant element in their social life, the scare of pandemic did not alter many of their eating habits. These consumers showed strong concerns for nutritional value and innovative food and more interest than the segment of "Light concerned and cook". They, also, demonstrated a light preference for price and food freshness labelling, but they showed no concern about any other food-related aspects such as cooking and food shopping. This segment in comparison to the segment of "Light concerned and cooks" consumers valued more the food price and the food freshness in terms of the expiration food dates, while they demonstrated the least concerns on the COVID-19 pandemic concerning the segment of "Sociable and safety seekers".

Previous studies like Bernués *et al.* (2012), Ripoll *et al.* (2015), Buitrago-Vera *et al.* (2016), Escriba-Perez *et al.* (2017), Kumar and Smith (2018) and Wongprawmas *et al.* (2018), provided empirical support to the segments that have been obtained in the current study. This relies on the fact that similarities have been occurred among the present segments with the ones from the relevant literature, despite the different aims of the above studies. Therefore, as long as the FRL power has already been verified (Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017), the

validity of the FRL instrument across different cultures is conducted.

Furthermore, the above results appeared to be consistent with the psychological belief that consumers in extreme situations tend to behave with the illusion of control' in an effort of managing their changeable world, as Wang *et al.* (2020) noted. Thus, "Unconcerned and price seekers" consumers since they considered eating as an enjoyable activity of their social life, refused to alter their food social habits, due to pandemics.

A chi-square test was performed to define the differences across the sociodemographic characteristics of the sample and the obtainable clusters, as shown in Table 5. Significant difference was found between the four clusters in terms of gender ($\chi^2$ = 12.101, p = 0.007 < 0.01), age ($\chi^2$ = 37.065, p = 0.005 < 0.01) and income ($\chi^2$ = 31.526, p = 0.007 < 0.01). Each segment is comprised mainly of women with a prominent range of age between 36 and 55 years old and monthly income ranging from 1001 to 1500 euro. The distinguished age group in the segment of "Sociable and safety seekers" consumers is ranged between 36 and 55 years old (18.3%), whereas the women were accounting 19.1% and the prominent monthly income was 1001 to 1500 euro (8.8%). The "Light concerned and cooks" segment is comprised mostly of women (5.8%) aged between 36 to 55 years old (5.3%) with the highest monthly income of 1001 to 1500 euro (3.7%). The "Unconcerned and price seekers" segment included mostly women (18.9%) with a notable age between 36 to 55 years old (17.8%) with the highest monthly income of 1001 to 1500 euro (13.3%). Finally, the segment of "Innovative and moderate concerned", involved mostly women (18.0%) with the highest age of 36 to 55 (21.6%) and a monthly income of 1001 to 1500 euro (11.3%).

**Table 5.** Sociodemographic characteristics of the four consumers' segments (%)

| Variables | Sociable and safety seekers | Light concerned and cooks | Unconcerned and price seekers | Innovative and moderate concerned | Total |
|---|---|---|---|---|---|
| Age* | | | | | |
| 18–25 | 1.3 | 0.9 | 3.9 | 2.8 | 8.9 |
| 26–35 | 3.0 | 1.5 | 5.5 | 2.2 | 12.2 |
| 36–45 | 8.2 | 2.0 | 7.1 | 8.8 | 26.1 |
| 46–55 | 10.1 | 3.3 | 10.7 | 12.8 | 36.6 |
| 56–65 | 3.3 | 1.6 | 1.7 | 4.0 | 10.6 |
| 66–75 | 1.0 | 1.0 | 1.6 | 1.3 | 4.9 |
| >75 | 0.0 | 0.1 | 0.1 | 0.5 | 0.7 |
| Gender* | | | | | |
| Men | 7.6 | 4.2 | 11.7 | 14.7 | 38.2 |
| Women | 19.1 | 5.8 | 18.9 | 18.0 | 61.8 |
| Marital status | | | | | |
| Married | 17.2 | 5.4 | 18.2 | 22.4 | 63.2 |
| Single | 4.5 | 2.1 | 7.5 | 6.3 | 20.4 |
| Divorced | 3.7 | 2.0 | 3.4 | 4.6 | 13.7 |
| Widow | 0.9 | 0.4 | 1.0 | 0.4 | 2.7 |
| Educational level | | | | | |
| Primary | 1.0 | 0.5 | 0.6 | 1.2 | 3.3 |
| Intermediate | 9.1 | 4.9 | 14.2 | 12.2 | 40.4 |
| Advanced | 16.8 | 4.6 | 15.9 | 19.0 | 56.3 |
| Monthly income, euro* | | | | | |
| ≤500 | 2.0 | 1.5 | 4.0 | 4.6 | 12.1 |
| 501–1000 | 7.7 | 2.2 | 9.1 | 6.6 | 25.6 |
| 1001–1500 | 8.8 | 3.7 | 13.3 | 11.3 | 37.1 |
| ≥1501 | 8.2 | 2.4 | 4.4 | 10.2 | 25.2 |

* Statistically significant at 99% confidence level.

Following, Wongprawmas *et al.* (2018), the identification of the extrinsic quality attributes of chicken meat that affected consumers' segments was performed by chi-square test, as Table 6 shows. The extrinsic chicken quality attributes that were chosen to be investigated were involving consumers': a) willingness to pay a higher price for chicken meat rearing with animal welfare conditions (Pouta *et al.*, 2010; Tsakiridou *et al.*, 2010; De Jonge, Van Trijp, 2014; Vanhonacker *et al.*, 2016; Djekic *et al.*, 2018), b) trust on the information provided to them (Toma *et al.*, 2011) especially by personal contact (Verbeke *et al.*, 2015) such as the local butcher (Krystallis *et al.*, 2007), c) trust on the labelling that demonstrates the rearing system (Naspetti *et al.*, 2015; Samant, Seo, 2016; Erian, Phillips, 2017), d) purchasing place (Kennedy *et al.*, 2004; Krystallis *et al.*, 2007; Walley *et al.*, 2015; Wongprawmas *et al.*, 2018). The results showed statistically significant differences among the consumers' segments concerning the place of purchasing chicken meat and trust in local butchers in terms of purchasing safe meat. The "Innovative and moderate concerned" consumers, on an average of 54.9% considered that the place of purchasing guaranteed the quality of chicken meat while the 41.8% of the "Light concerned and cooks" consumers had the same perception. Moreover, trust in local butcher regarding chicken meat's safety revealed a percentage of 49.3% by "Light concerned and cooks" consumers, then the "Innovative and moderate concerned" consumers (35.6%). Furthermore, only one segment appeared with a statistically significant difference in consumers' willingness to purchase higher price chicken meat that was produced by animal welfare standards. Especially a rate of 32.8% was revealed on the "Light concerned and cooks" consumers. In contrast, the perception of labelling information regarding the rearing systems and the perception that local butcher provided the consumers with the desired quality of chicken meat, didn't show a statistically significant difference to all segments.

**Table 6.** Results of chi-square tests on consumers' segments with chicken meat attributes

| Items | $\chi^2$ | Df | P-value |
|---|---|---|---|
| Willingness to pay a higher price for chicken meat that is produced by animal welfare standards | 61.519 | 15 | 0.000 |
| I do not believe the label information regarding the rearing system of the chicken | 5.955 | 12 | 0.918 |
| The place that I purchase chicken meat *e.g.* supermarket, steakhouse, *etc.*, offers me quality meat | 34.521 | 12 | 0.001 |
| My butcher offers me the quality meat I desire | 17.515 | 12 | 0.131 |
| I trust my butcher for the safety of the chicken meat that I purchase | 28.320 | 12 | 0.005 |

Additionally, the above results appeared to be consistent with the findings of other studies (Kennedy *et al.*, 2004; Krystallis *et al.*, 2007; Ripoll *et al.*, 2015; Walley *et al.*, 2015; Wongprawmas *et al.*, 2018). Analytically, consumers of the current study, especially of the segments "Innovative and moderate concerned" and "Light concerned and cooks", considered the place of purchasing as a dominant extrinsic quality cue of chicken meat. Moreover, as previous studies (Kennedy *et al.*, 2004; Krystallis *et al.* 2007; Sismanoglou, Tzimitra-Kalogianni, 2011; Raimundo, Batalha, 2015; Ripoll *et al.*, 2015) have noted the butcher as the one that provided consumers safe chicken, the consumers of this study ("Light concerned and cooks" and "Innovative and moderate concerned") appeared, also, to trust the local butcher for providing them safe chicken meat. Furthermore, inconsistent with the literature (Tsakiridou *et al.*, 2010; Van Loo *et al.*, 2014; Vanhonacker *et al.,* 2016) the consumers ("Light concerned and cooks") of the present study revealed to be a willingness to pay a higher amount for chicken meat that is produced by animal welfare standards. Although, in contrast with other studies (Pouta *et al.*, 2010; De Jonge, Van Trijp, 2014; Van Loo *et al.*, 2014; Kehagia *et al.*, 2017) consumers of this study didn't demonstrate a preference for labelling information concerning the rearing system, whereas the perceived chicken meat quality wasn't related with the butcher. These findings might have derived from the fact that as Krystallis and Arvanitoyannis (2006) and Krystallis *et al.* (2007) have noted, Greek consumers usually trust their visual chicken meat evaluation (like smell, colour, tenderness) together with their contact with the butcher, consequently, making difficult to be replaced them by trademarks and quality certifications for chicken meat.

## Conclusion

The European poultry meat sector has been significantly affected by the COVID-19 crisis, mainly in terms of consumption. Specifically, in Greece, between the years 2019 and 2020, the level of reduction in poultry meat imports was 14.2%. Additionally, the socioeconomic implications of the COVID-19 pandemic may influence meat consumption (Nicola *et al.*, 2020) and possibly chicken meat consumption. Moreover, the FRL construct has been proposed as one of the best segmentation tools in the food sector (Grunert, 2019) and according to the best of our knowledge, no published research has used the FRL approach on chicken meat consumption of Greeks consumers. Thus, the current study tried to segment chicken meat from Greek consumers after the first wave of the COVID-19 pandemic. Greek consumers' segmentation was developed by the use of a food-related lifestyle model.

Exploratory factor analysis was conducted and six factors were identified: i) "Nutritional value and innovation", ii) "Food security after the first wave of the pandemic", iii) "The role of food in social life", iv) "Ways of shopping", v) "Planned consumption and enjoyment", and vi) "Love for cooking". The hierarchical cluster analysis yielded the final food consumer segments that by the relevant literature (Krystallis,

Arvanitoyannis, 2006; Krystallis *et al.*, 2007; Bernués *et al.*, 2012; Ripoll *et al.*, 2015; Buitrago-Vera *et al.*, 2016; Escriba-Perez *et al.*, 2017; Kumar, Smith, 2018; Wongprawmas *et al.*, 2018) were labelled as: "Sociable and safety seekers", "Light concerned and cooks", "Unconcerned and price seekers", "Innovative and moderate concerned".

Analytically, the results revealed that only the segment that strongly switched their food consumption behaviour, due to the COVID-19 pandemic was the "Sociable and safety seekers" consumers. In contrast, the "Unconcerned and price seekers" consumers demonstrated the least concerns towards the COVID-19 pandemic, concerning all other segments. However, the segment of "Light concerned and cooks" consumers appeared to have minimal concerns regarding food safety aspects like crowded places or safe convenience food, after the first wave of the pandemic. Additionally, the segment of "Innovative and moderate concerned" showed moderate concerns, but more in comparison to the "Light concerned and cooks" consumers

Finally, "Light concerned and cooks" and "Innovative and moderate concerned" consumers appeared to consider the place of purchasing as a dominant extrinsic chicken meat quality cue. In addition, these consumers revealed to trust the butcher in terms of providing them safe chicken meat. Additionally, only "Light concerned and cooks" consumers showed a willingness to pay a higher amount for chicken meat that is produced by animal welfare standards, but there was no evidence that Greek consumers trusted the label information concerning the rearing system.

The scientific value of this study was to lead marketers to orient their marketing strategy towards the external quality attributes of chicken meat, like animal welfare standards and place of purchasing. Hence, chicken meat can be differentiated and this product can be targeted to specific Greek consumer segments like "Light concerned and cooks" and "Innovative and moderate concerned" that was identified after the first wave of the COVID-19 pandemic. The limitation of this research lay in the exclusion of analysis of types of chicken meat products on all consumers' segments as well as the analysis of intrinsic quality cues of chicken meat on all consumers' segments.

Additionally, further research might be conducted for identification of the quality cues that might dominate the Greek chicken meat food chain, whereas the results of this study might be used as a fundamental element for enhancing the knowledge of consumers' behaviour towards chicken meat after the first wave of the pandemic.

**Conflict of interest**

The author declares that there is no conflict of interest regarding the publication of this paper.

**Author contributions**

The authors contributed equally to the preparation of the manuscript.

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