

## COMPARISON BETWEEN THE IRISH AND GREEK MEAT CONSUMPTION CHOICES: A SURVEY BETWEEN THIRD LEVEL INSTITUTIONS

Skoumpa S.\*, Cunha Neves A., Carroll R., Cleary J. and Phelan D.

Enviro CORE, Department of Applied Science, South East Technological University,  
Kilkenny Road, Carlow, Co. Carlow, R93 V960, Republic of Ireland.

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\*Corresponding Author

Skoumpa S.

Enviro CORE, Department  
of Applied Science, South  
East Technological  
University, Kilkenny Road,  
Carlow, Co. Carlow, R93  
V960, Republic of Ireland.

### ABSTRACT

Meat consumption and purchasing patterns are dependent on numerous sociodemographic factors such as age, country of origin and income. This study explored and compared the differences between the purchasing patterns of consumers originating from Republic of Ireland and Greece and how these choices are affected by origin and marketing of meat products. A survey was created in both English and Greek languages and was distributed in a third level institution in each country, with 722 participants in total (n = 518 for Ireland; n = 204 for Greece). No significant differences were found among the two

populations who were positive in regards to meat consumption (89.0 % Irish; 93.6 % Greeks) while “Environment” and “Health” reasons were mainly responsible for meat abstinence. Irish participants showed a higher preference for pre-packed cut products, while Greek participants showed a higher preference for offal, fresh-cut and free-range products. In addition, more Greeks chose “Butchers” as the place of purchase while more Irish chose “Supermarket. “Price” was the most determining factor for both populations regarding product characteristics importance while “Traceability” was also found to be of importance to the majority of consumers from both countries. Finally, “Internet” was the most preferred source of information for both populations. This study’s aim was to determine the meat purchasing patterns of Greek and Irish consumers. These findings will enable us to correlate these choices with actual nutritional value of various origin meat products in future work.

**KEYWORDS:** Meat consumption; survey; consumers; origin; Greece; Ireland.

## INTRODUCTION

Globally, meat is a basic element of everyday diet, with a few exceptions, such as India, where meat consumption is limited while there are also restrictions in animal slaughtering (i.e. forbidden slaughtering of beef) (Sarkar & Sarkar, 2016). In other countries, animals slaughtered for meat, have to be killed under certain conditions in order to fulfill a religious value (i.e. kosher, halal) (Farouk *et al.*, 2014).

Choice and purchase of various meat products is most definitely linked to culture and religion, while even between countries of the European Union major differences are observed in regards to animal product consumption (Westhoek *et al.*, 2011). For example, pork was widely consumed among populations in South European countries such as Spain while in Northern countries such as the Netherlands the population showed lower preference for pork consumption (De Boer *et al.*, 2005). It was evident that location and country of origin of consumers plays an important role in the consumer habits and patterns of meat consumption therefore, it was the purpose of this study to compare the purchasing patterns between population of a south and north European country, as it has been shown that north and south European consumer habits exhibited significant variations when it comes to meat (De Boer *et al.*, 2005).

Regarding meat trade between Republic of Ireland and Greece, the Department of Agriculture Food and Marine (Ireland) indicated that for the year 2022 Ireland exported 2 tons of pig meat, 159 tons of beef while no exports were recorded for the same year for poultry (Department of Agriculture Food and Marine, 2022).

According to the Central Statistics office (CSO) during the year 2021 the per capita Human consumption of total meat in Republic of Ireland saw an increase of 4%, when compared to the year 2020. It was also concluded that in 2021 Irish consumers showed a higher preference for poultry, with that meat type occupying 42% of the total meat consumed, while other sources such as pork, beef & veal and sheep meat occupied 34%, 21% and 3% of total meat consumed respectively (Mairead Griffin & Derek O'Sullivan, 2022). These results made it evident to us how consumer preference can impact meat market in terms of: 1) farming choices of meat producers, 2) availability and supply of products and 3) pricing of meat products from retailers.

Research from Tsitsos *et al.* (2021) presented scientific findings on Greek consumer preference regarding beef and sheep meat consumption. Specifically, the annual per capita consumption in kilogrammes (kg) was 16.1 kg for bovine meat and 12.47 kg of lamb- mutton and kid-goat meat for the year 2013 (FAOSTAT, 2021). Greek consumers considered labels containing Protected Denomination of Origin (PDO) and Protected Geographical Indication (PGI) certifications as well as carbon footprint indication on meat products very important, while Greece was second after France in regard to willingness to pay (WTP) more for red meat organic products and Greek consumers showed a negative perception of “high protein” content of red meat products (Dudinskaya *et al.*, 2021).

According to the Hellenic Statistical Authority, monthly average household consumption in grams (g) of fresh beef, fresh and frozen pork, fresh lamb, goat, fresh sheep and kid, fresh poultry, frozen poultry and fresh and frozen offal was 12.77, 27.25, 96.69, 15.51, 173.44, 0.94 and 2.36 g respectively (Hellenic Statistical Authority, 2022).

In regards to meat, product labeling with indications such as “organic” and “free-range” have appeared more and more on retail meat products of all sources. This indicated an increase in the need for emphasis on meat product labeling as a market strategy, possibly originating from the law of supply and demand. Research from O’Donovan & McCarthy (2002) on the consumer’s preference for organic meat in Republic of Ireland, indicated an increase in consumers’ concern on the negative effects mass production of meat has on overall human health.

A survey from Krystallis & Arvanitoyannis (2006) assessing the perception of meat quality among Greek consumers found that meat consumption decreased among younger consumers, while there was a shift in purchase of meat from butchers to pre-packed meat found in supermarkets. Finally, there was an evident preference for meat products of better sensory attributes and flavor among Greek consumers.

The aim of this study was to assess the meat purchasing patterns of consumers from Republic of Ireland and Greece in regards to purchase consumption of meat products. This will be of importance to the meat industry and supply chain in both countries, since a further understanding of consumer traits and priorities will assist in meat industry providing, supplying and labelling meat products in the most appealing way for customers. Through this

study, it is also possible to address any novelties that can be included in future meat product developments as well as open new trade routes for the two countries.

## MATERIALS AND METHODS

### *Survey design and implementation*

Our surveys focused on the comparison of purchasing patterns among Irish and Greek populations with an emphasis on meat origin and consumer awareness. Survey questions and response options used for the purposed of this study are shown in Table 1. Survey questions were prepared originally in English, and were then translated in Greek by a native Greek speaker. Surveys, both in Greek and English language were prepared online using Microsoft Forms and the link was sent to responders in South East Technological University (at the time survey was sent third level institution was named Institute of Technology Carlow) and Aristotle University of Thessaloniki (Department of Chemistry) by email to achieve maximum possible number of participants, while the two third level institutions were chosen as an easily accessible pool of participants of all age groups, nationalities and sexes, that was easily comparable. A sample of 10% of the predicted responders was ran to confirm the validity of the survey and the results of those responders were subtracted from the final data.

### *Statistical analysis*

For the statistical analysis, the software SPSS (IBM SPSS Statistics (Version 27)) was used. A chi-squared test of independence was used to test for significant association between variables and Cramer's V was used to measure the strength of association. A Cramer's V over 0.25 is classified as very strong, over 0.15 is strong, over 0.10 is moderate and over 0.05 is weak. The 5% level of significance was used throughout ( $P < 0.05$ ).

## RESULTS

Survey questions and results of this study are shown in Table 1. Number of participants in the Greek survey was  $n = 201$  and in the Irish survey  $n = 528$ . For the Irish survey, 63% of participants were "Female", 36% were "Male" while 1% responded "Other", while for the Greek survey 76% of participants were "Female", 22% were "Male" while 1% responded "Other".

*Table 1: Survey results for Greek and Irish participants.*

<i>Survey questions</i>	<i>Responses</i>	<i>Irish % [95% CI]</i>	<i>Greek % [95% CI]</i>	<i>P-value</i>	<i>Cramer's-V</i>
<i>Do you consume meat?</i>	<i>Yes</i>	89 [86.0 , 91.4]	93.6 [89.3 , 96.2]	0.063	0.069

		n = 518	n = 202		
<b>Reasons for not consuming meat</b>	<b>Religion</b>	3.5 [1.0 , 11.9]	7.7 [1.4 , 33.3]	0.502	0.08
	<b>Climate/Environmental</b>	71.9 [59.2 , 81.9]	76.9 [49.7 , 91.8]	0.715	0.044
	<b>Health reasons</b>	66.7 [53.7 , 77.5]	84.6 [57.8 , 95.7]	0.203	0.152
	<b>Financial</b>	5.3 [1.8 , 14.4]	15.4 [4.3 , 42.2]	0.201	0.153
	<b>Other</b>	50.9 [38.3 , 63.4]	46.2 [23.2 , 70.9]	0.759	0.037
		n = 57	n = 13		
<b>Type of meat consumed</b>	<b>Standard - Ready cut</b>	73.2 [69.2 , 76.8]	42.4 [35.8 , 49.2]	<0.001***	0.291
	<b>Processed meat</b>	30 [26.2 , 34.1]	25.6 [20.1 , 32.0]	0.246	0.044
	<b>Ready meals</b>	10.3 [7.9 , 13.2]	11.1 [7.7 , 16.4]	0.674	0.016
	<b>Fresh cut</b>	64.3 [60.0 , 68.3]	82.8 [77.0 , 87.3]	<0.001***	0.181
	<b>Free range</b>	27.2 [23.5 , 31.3]	46.8 [40.1 , 53.7]	<0.001***	0.188
	<b>Organic</b>	15.8 [12.9 , 19.2]	15.8 [11.4 , 21.4]	0.996	0
	<b>Offal</b>	2.4 [1.4 , 4.1]	6.4 [3.8 , 10.6]	0.008**	0.099
	<b>Other</b>	4.1 [2.7 , 6.3]	4.4 [2.4 , 8.2]	0.862	0.007
	n = 507	n = 203			
<b>Place of purchase</b>	<b>Farmers markets</b>	5.7 [4.0 , 8.0]	6.9 [4.2 , 11.2]	0.532	0.023
	<b>Organic shop</b>	3.9 [2.5 , 6.0]	5.4 [3.1 , 9.4]	0.371	0.033
	<b>Butchers</b>	56.8 [52.5 , 61.1]	78.8 [72.7 , 83.9]	<0.001***	0.205
	<b>Supermarket</b>	88.5 [85.4 , 91.0]	66.5 [59.8 , 72.6]	<0.001***	0.259
	<b>Other</b>	3.7 [2.4 , 5.7]	6.9 [4.2 , 11.2]	0.067	0.068
	n = 512	n = 203			
<b>Characteristics</b>	<b>Price</b>	72 [67.9 , 75.8]	69 [62.3 , 74.9]	0.417	0.031
	<b>Packaging</b>	12.5 [9.8 , 15.7]	10.8 [7.3 , 15.9]	0.539	0.023
	<b>Origin</b>	58.1 [53.8 , 62.4]	64 [57.2 , 70.3]	0.147	0.054
	<b>Nutritional value</b>	45.4 [41.1 , 49.8]	57.1 [50.3 , 63.8]	0.005**	0.106
	<b>Specific ingredient</b>	37.9 [33.8 , 42.2]	37.4 [31.1 , 44.3]	0.909	0.004
	<b>Other</b>	8.7 [65.7 , 11.5]	11.8 [8.1 , 17.0]	0.215	0.047
	n = 504	n = 203			
<b>Traceability</b>	<b>Yes</b>	96.1 [94.0 , 97.5]	98 [96.1 , 99.9]	0.194	0.046
		n = 511	n = 203		
<b>Source of information</b>	<b>Internet</b>	51.3 [46.9 , 55.6]	75.9 [69.5 , 81.2]	<0.001***	0.226
	<b>Books</b>	12.2 [9.6 , 15.3]	17.2 [12.7 , 23.0]	0.076	0.067
	<b>Educational Programs</b>	24 [20.4 , 27.9]	14.8 [10.6 , 20.3]	0.007**	0.101
	<b>Magazines</b>	9.4 [7.1 , 12.3]	9.9 [6.5 , 14.7]	0.847	0.007
	<b>Newsletters</b>	6 [4.2 , 8.4]	31.5 [25.5 , 38.2]	<0.001***	0.34
	<b>Other</b>	20 [16.7 , 23.7]	18.2 [13.5 , 24.1]	0.599	0.02
	n = 501	n = 203			

Initially, the question “do you consume meat” was asked to the survey participants in order to reduce bias and assess any significant differences in the number of meat consumers between Irish and Greek responders (Figure 1 a).

No significant differences were found between the number of Irish and Greek responders that consumed meat, with 89.0% and 93.6% of the Irish and Greek consumers respectively responding “Yes” to this question.

No significant difference was found for reasons for not consuming meat among Irish and Greek participants, with the main reasons being “Environmental” and “Health reasons”. Cramer’s V for “Health reasons” was higher than 0.15 which indicated a strong association for “Health reasons” as a reason for not consuming meat (Table 1). Fewer respondents were motivated by “Religious” and “Financial” justifications however, there was a strong association for “Financial” factor as the reason for abstinence from meat, with a Cramer’s V being higher than 0.15 (Table 1, Figure 1 b).

There were multiple significant differences observed between Greek and Irish responders for the choice of meat product type (Figure 1 c). Specifically, standard pre-packed cut meat choice was significantly higher among Irish responders compared to Greek ones. Cramer’s V for “Standard-Ready cut” “Fresh cut” and “Free range” meat products was above 0.25 for the first and 0.15 in the two latter cases, which indicated a significantly strong and strong association respectively between these and consumers’ choice of meat products. There was a significantly higher tendency for Greek consumers to purchase fresh cut (butcher) and free-range meat products compared to Irish ones. Finally, offal consumption was significantly higher for Greek consumers (Table 1, Figure 1 c).

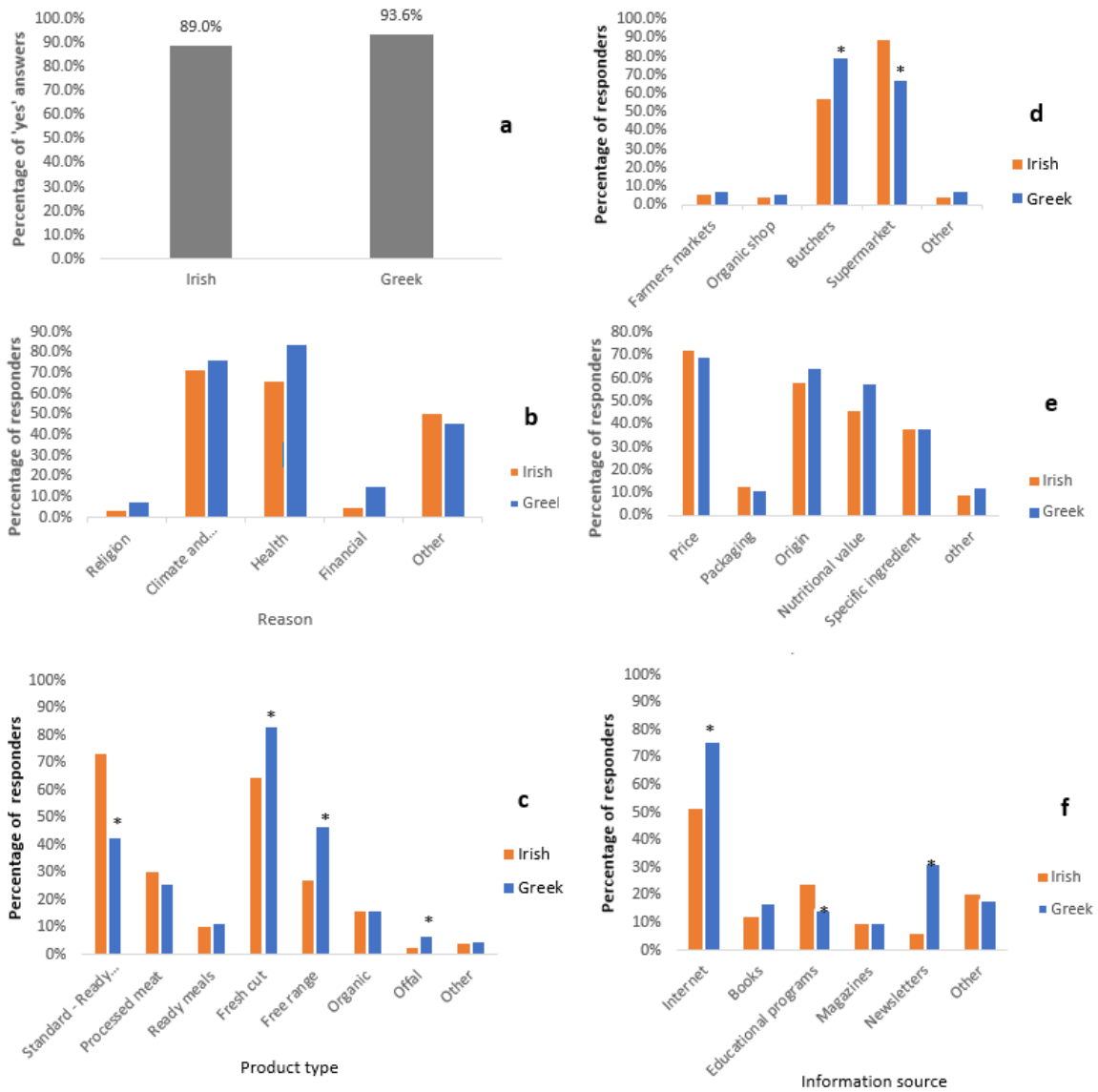
A statistically significant difference was observed for the place of choice for purchasing meat, with Greeks choosing predominantly the “Butchers” as place of meat purchase, while most Irish participants chose the “Supermarket” as the place of meat purchase. Cramer’s V was found to be over 0.15 for “Butchers” and over 0.25 for “Supermarket” (Table 1) which indicated strong and very strong association respectively, between these consumers’ choice of place of purchase. It is also worthwhile mentioning the low preference for “Farmer’s markets” and “Organic shops” (Figure 1 d).

In regards to the characteristics consumers considered when purchasing meat products, there were no statistically significant differences for any of the characteristics between the two populations, but it was evident that “Price” was the most determining characteristic-factor that Irish and Greek consumers considered when purchasing meat, followed by “Origin”, “Nutritional Value” and “Specific ingredient” (Figure 1 e).

Traceability and origin of meat products was a factor that was voted as important for final meat quality from both Greek and Irish participants. This came to confirm our previous statement, which indicated that inclusion of origin in product label could possibly be connected to consumers’ demands for traceable products (Figure 1 e).

The final interest of this survey was the information sources consumers predominantly used in order to get updates on meat products, meat quality and nutritional value (Figure 1 f). “Internet” was the most popular choice of source of information for Irish and Greek participants, with Greek participants showing a significantly higher preference for “Internet” as source of information in comparison to Irish. Cramer’s V for “Internet” was over 0.15 (Table 1) which indicated a strong association between consumers’ choice of source of information and “Internet”. Irish participants showed a significantly higher preference for “Educational Programs” as their source of information, while the choice of “Newsletters” was significantly more popular among Greek participants. In any case it is evident that online sources were the dominant means of researching and finding out information about meat consumption.





**Figure 1:** Graphs displaying percentage of responders that consume meat with an Irish ( $n=518$ ) and Greek ( $n=202$ ) nationality (a), reasons for not consuming meat ( $n=700$ ) among both Irish and Greek responders (b), type of meat consumed by Irish ( $n=507$ ) and Greek ( $n=203$ ) responders. (c), place of purchase of meat products by Irish ( $n=512$ ) and Greek ( $n=203$ ) responders (d), characteristics taken in account by Irish and Greek ( $n=707$ ) responders when purchasing meat products (e) and source of information for Irish ( $n=501$ ) and Greek ( $n=203$ ) consumers. (f). Values represent total percentage values with \* representing significance within the groups ( $P < 0.05$ )

## DISCUSSION

The present study focused on the effect of sociodemographic factors on consumer's choices regarding the purchase of meat products. A comparison of the purchase patterns of Irish and



Greek third level institution populations was presented, while the survey questions focused on the type of meat purchased, the place of purchase, product characteristics taken into consideration by consumers, traceability of product and sources of information on meat product origin and nutritional value used most commonly by consumers.

The majority of participants responded positively to meat consumption with no significant differences among the two populations, results which were similar to ones reported in literature about the US and European context, which showed that 5-10% of the population didn't consume meat (Sanchez-Sabate & Sabaté, 2019; Willett *et al.*, 2019).

In regard to the reasons for not consuming meat products, this survey's results were in accordance with results from Krystallis & Arvanitoyannis (2006), while other researchers indicated the importance of environment and sustainability in that choice (Bogueva *et al.*, 2017; Neff *et al.*, 2018; Sanchez-Sabate & Sabaté, 2019). It is worth considering that in other countries these factors' popularity varied among populations. For example, in India, consumption of meat was limited due to a number of factors such as climate, geography, religion and food culture (Devi *et al.*, 2014) while in Iraq, income was a determining factor in meat consumption (Abdalla *et al.*, 2023). In the case of Ethiopia meat consumption was tightly connected to religion, which dictated the source animals and the timeframe in which meat could be consumed (Seleshe *et al.*, 2014). In Japan, financial growth and income increase over the years induced a growth in demand for meat consumption (Pingali, 2007; Sasaki *et al.*, 2022) and a shift from staples, which highlighted the importance of financial factors in meat consumption in this case.

It was also evident that Greek consumers showed a higher preference for fresh meat products, while literature also supported that by indicating that frequent meat consumers from Greece were not oriented towards choosing pre-packaged meat (Krystallis *et al.*, 2007).

Moroney and Briscoe (2009) indicated that consumers purchasing products in farmer's markets aimed for high quality and local products, while they also took into consideration food miles of products. For this study's participants, it was evident that more conventional supply chains (i.e. butchers-supermarkets) were dominant. However, it is worthwhile mentioning these results may occurred from the fact that most of this study's participants were students, with most participants belonging to the age group of 18-25.

Older research came in agreement with current results regarding importance of meat characteristics ("Origin", "Nutritional value", "Price" and "Specific ingredient"), since it suggested that older and younger Greek consumers were price sensitive when it came to meat purchase, however middle-aged Greeks displayed a lower price sensitivity (Krystallis *et al.*, 2007). There was a number of sensory and psychological factors that affected each consumer's behavior, with some discussed already here, however price (low or middle) was confirmed as of the greatest importance for consumers here and in other literature (Font i Furnols *et al.*, 2011; Font-i-Furnols & Guerrero, 2014; Realini *et al.*, 2013).

Finally, with "Internet" as the most common choice of consumers of both populations as a source of information, it's worth mentioning that online sources can have positive and negative effects. Credible sources (i.e. scientific journals) have provided reliable information contributing to nutrition education of consumers (Brug *et al.*, 2005), while other sources have promoted less healthy dietary habits by presentation of inaccurate information (i.e. peer-to-peer communication venues) (Jung *et al.*, 2016).

## CONCLUSIONS

The aim and objective of this work was to provide us with more information on the thoughts and preferences of consumers between the two countries. It was evident from these results and in agreement with literature that Greek consumers showed a higher preference for fresh meat purchased from local butchers, while Irish consumers preferred pre-cut and packaged meat products available in retailers. The sources of information that each of the population used also differ, although "Internet" was the most common choice among both populations. However, it is worth mentioning that even though internet can provide useful information in terms of nutritional value of foods and dietary choices, much caution is needed when choosing web sources, since not all websites provide proven scientific facts and reliable information. Most of the survey participants in both countries declared they consume meat while Greek participants showed a higher preference of free-range and offal meat products than Irish participants. Even though there were differences in the most preferable place of purchase and type of meat chosen by each population, both populations showed an increased interest for traceability of meat products.

The further impact of the choice of these various meat products in terms of nutritional value, health benefits and flavour, will need to be assessed and investigated further in the future. It was important to understand how purchasing choices and perceived benefits were connected

with the actual benefits these products offer to consumers and how labelling of products and marketing can influence consumers' opinion. It is our goal to investigate these factors further in future research work and objectively assess the labelling characteristics of meat products in correlation with each product's origin, as well as compare the nutritional profile of meat products of different origin.

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