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Abstract

Achieving a low-carbon and sustainable economy is a long-term goal that EU aims at achieving in the next few decades: the potential role of bioeconomy is likely to make the difference, and in particular, the EU aquaculture and the seafood processing industry has the potential to contribute substantially to the emergence of bioeconomies (for instance through new – niche - markets for bio-based products such as algae, etc). In this particular framework, understanding how to enhance cleaner and more sustainable consumption patterns is preliminary to the transition towards more equitable and sustainable markets. The present analysis investigates the role of consumers' attitudes with respect to sustainable attributes (namely food safety and respect of the environment) in order to suggest on their potential role to catalyze the transition toward bioeconomies. Up to date, empirical investigations on this issue are limited to few markets, and studies on aquaculture are particularly scant. The gap is reduced by the present analysis: it has been implemented a survey on fish consumers to investigate how their attitudes toward food safety and environmental issues tend to influence consumption choices, and it is shown that those attitudes are important determinants of consumers choices. Put differently, a cleaner and more sustainable supply chain (i.e through a safer, and environmental friendly product) is likely to enhance consumption of oysters. To the extent that policy makers, producers, and taxpayers are interested in enhancing sustainable bioeconomies, understanding the relevance of attitudes toward food safety and environmental sustainability is an important and pressing goal. The analysis, novel in its application to a high quality product, speaks in this direction and will help understanding how to accelerate the transition to sustainable bioeconomies.

Keywords: Attitudes, Consumption, Food safety, Environment, Seafood, Sustainability

JEL Codes: Q11, Q18, Q22, Q28

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On consumption patterns in oyster markets: the role of attitudes

1. Introduction

Achieving a low-carbon and sustainable economy is a long-term goal that EU aims at achieving in the next few decades: the potential role of bioeconomy is likely to make the difference, and, in particular, the EU aquaculture and the seafood processing industry has the potential to substantially contribute to the emergence of bioeconomies (for instance through new – niche - markets for bio-based products such as algae, etc). The aquacultural sector has key characteristics worth mention. In particular, the recent growth in global fish consumption lead consumption to raise from 30 million tonnes in 1960 to 130 million tonnes in 2012 (FAO, 2014). Such an impressive increase in global fish consumption is due to several factors: first, a considerable population growth; second a raise in per-capita incomes and the change of food habits; third, a considerable expansion of fish production (Bronnmann et al., 2016). The increase in global fish production is pushed by aquaculture, accounting for half of global fish production (FAO, 2014). In the EU, aquaculture provides 20% of total fish production (European Commission, 2014). However, from 2000 to 2012, while the world aquaculture production has more than doubled (from 32.4 to 66.6 million tonnes), the EU aquaculture production has fallen from 1.4 to 1.3 million tonnes (FAO, 2014): a datum that is very remarkable considering that the EU market of fish and seafood products depends for 65% by imports (European Commission, 2014). These changes open to new challenges for policymakers, and stakeholders: the rapid growth may have an impact on quality, and on the environment, threatening the sustainability of the supply chain. Several scholar have analyzed the role and the impacts of production techniques on the environment, as well as consumers' attitudes toward sustainable foods (Zhu et al., 2013; Hynes et al., 2014), but studies on aquaculture are in limited number (Carlucci et al. 2015; Carlucci et al., 2017).

The EU Commission has recently published Strategic Guidelines for a more sustainable

development of EU aquaculture (European Commission, 2014): starting from January 1st 2014 (Reg. EU No 1380/2013), the Common Fishery Policy (CFP) has prioritized the competitiveness of EU aquaculture in compliance with high standards of consumer protection, animal welfare, and environmental sustainability. Put differently, EU policymakers are aiming at favouring the development of a cleaner, and more sustainable aquaculture sector: understanding consumers' attitudes toward sustainable foods is preliminary to the transition towards more equitable and sustainable markets.

The growing consumers' expectation for food quality, food safety and respect of the environment is offering new business opportunities for EU aquaculture producers who are willing to differentiate their products and serve specific markets (European Commission, 2014). New labelling provisions are contained in the reformed Common Market Organization (Reg. EU No 1379/2013): fish products must bear mandatory information on the commercial and scientific names of the species, on the provenience (e.g. caught or farmed product), on the freshness and on the date of minimum durability; in addition, caught fish must display detailed information on the catch area, while farmed fish must bear indications on the country of origin. Additional voluntary information can also be provided. However, consumers' choices are not only driven by intrinsic and extrinsic attributes of the product, but also by consumers attitudes toward immaterial aspects such as food safety or respect of the environment. Consumers' attitudes are the object under investigation in the present analysis.

The remainder of the article is organized to have next section devoted to the conceptual basis of the paper, followed by sections on the description of the survey and of the methodology. The subsequent section provides a detailed description of the empirical results. The paper concludes with recommendations for practitioners and policy makers.

2. On the attitudes toward food safety and environmental issues

The perception of quality attributes is complex and plays a key role in the market of fish and seafood products. Apart for personal factors - values, beliefs, attitudes, and demographics (Köster, 2009) - the perception of quality depends on how consumers infer quality from a variety of signals and information sources (Fernqvist and Ekelund, 2014; Carlucci et al., 2015; Fonner and Sylvia, 2015; Sjöberg, 2015; Bi et al., 2016; Garza-Gil et al., 2016; Jaffry et al., 2016; Rickertsen et al., 2017). The most important quality attributes of fish and seafood - freshness, naturalness, healthiness, nutritional value, geographical origin and production method - are "credence" attributes and cannot be assessed by consumers even after consumption. Thus, consumers tend to use extrinsic cues such as price or labels in order to infer on fish quality. Brécard et al.. (2012) showed that, *ceteris paribus*, health-label is preferred to eco-label and fair-trade label. Duggan et al. (2016) conclude on the use of fisheries certifications as tool to communicate seafood sustainability. However, despite public policies are often based on the presumption that additional information help consumers in their decision-making process, the risk of information overloading is a potential danger (Gracia, Loureiro and Nayga, 2009): it is likely that consumers ignore some label information if they are perceived as not predictive of quality. This hypothesis is supported by a pan-European survey (Pieniack et al., 2007) that investigated trust in information sources on fish products: despite most respondents declared to take into consideration all labels, it is proved they are most interested in information on safety guarantees and quality marks.

As already mentioned, studies on how attitudes toward food safety and environmental issues influence consumers' choices are limited in number. On the other, it is likely that consumers' attitudes play a significant role: consumers have different perceptions on the degree of safety of seafood, depending on the country of origin of the product (Wang et al., 2013). The evidence on how environmental issues affect consumption of seafood is rather mixed: Hall et al. (2013) found that consumers are uncertain about environmental benefits and problems associated with aquaculture; Olson et al. (2014), McClenachan et al. (2016), Fabinyi,ì (2016) and Swartz et al.

(2017) conclude that consumer support seafood sustainability and are very concerned about environmental sustainability.

Third-party certifications and related labelling (e.g. organic labels, eco-labels, fair-trade labels) are emerging novel instruments for ensuring food quality and safety in the global agrifood system: some scholars argue they are perceived as objective and independent (Albersmeier, Schulze, Jahnand Spiller, 2009), but the efficacy of such schemes is crucially determined by consumers attitudes toward food safety and environmental issues. Given these premises, two research questions are worth investigation: first, which type of consumers' attitudes are likely to matter in consumer choices? second, how consumers attitude toward food safety and environmental issues tends to alter consumers decisions?. Few European studies explored consumers' attitudes toward certification labels on seafood products, whilst the studies on food safety and environmental issues in food consumption choices is increasing more and more: until now, a consensus on how consumers attitudes influence their choices has not been reached. For instance, Massoud et al. (2010) found that the food industry is generally more concerned with safety issues rather than environmental issues. On the contrary, McClenachan et al. (2016) conclude that consumer strongly support for environmental sustainability in seafood markets.

The present analysis is conducted on fish consumers in Italy in order to investigate how attitudes toward food safety and environmental issues influence consumption choices. The focus is on the oyster market which account for more than 12% of EU aquaculture in terms of production value[i] and it is therefore relevant for the whole seafood sector. To the extent that policymakers, producers, and taxpayers are interested in enhancing the sustainability of the aquacultural markets, understanding how consumers' attitudes influence their choices is an important and pressing goal.

The contribution of the paper is at least twofold. First, by analyzing a very high value product (oyster) it is possible to understand how attitudes toward sustainability influence consumption of high quality goods in niche markets: the findings help understanding how to enhance the transition

to bioeconomies. The difficulty in surveying consumers of niche products (limited in number by the nature of the market) makes the present analysis of particular interest: it complements previous evidence on larger markets. Second, by focusing on attitudes, the analysis complements the literature on certifications and labels: the analysis provides insights to characterize solutions to guide consumers in their decision making process (*e.g.* though information campaign on the importance of sustainability and bioeconomies), apart from informing on the potential impact of ex-post solutions (e.g. when the product is marketed).

3. Methodology

3.1. The choice experiment

A pilot study, based on focus group discussions, precedes the analysis, so to select the relevant quality attributes associated with consumer purchasing decisions, and avoid to under- or over-identify the model specification. The four focus groups, conducted in major Italian cities (Milano, Bologna, Roma and Bari), allowed us to investigate consumers' purchasing behaviours and consumption habits for oysters. The next step has been to conduct two in-depth interviews with economic operators that have great expertise in production, processing and selling of oysters. Four main attributes affecting consumers' choice for oysters have been identified: species, country of origin, size and price. The choice experiment includes these four attributes and other additional variables, such as certification labelling and preparation format, that have been introduced as control factors.

[TABLE 1 HERE]

Each attribute appears in the choice experiment with two or more levels, as detailed in table 1. The study considers the two most important species of oysters cultivated and sold in Europe: the native "flat oyster" (*Ostrea edulis*) and the most common "cupped oyster" (*Crassostrea gigas*), native of

Japan and brought to Europe in the 1970s. Three different country of origin labels have been considered: "Italy" (the country of the survey), "France" (the most important and renowned oyster producer country in Europe), and "Other EU countries". The choice experiment includes three size categories (small, medium and large), and four levels of price (€4.00, €6.00, €8.00, €10.00 per half dozen), representing the range of market prices at the time of the study. Finally, the analysis is based on three types of preparation formats with an increasing level of convenience (closed oysters, pre-shucked oysters, and half-shell oysters[ii]), and four types of certification labels: a safety label, a traceability label, an organic label, and a "no certifications" label[iii].

Given the experiment design a full factorial experimental - with all possible combinations of the six attributes with related levels and the three alternatives – would have required 864 (*i.e.* $2 \cdot 3^3 \cdot 4^2$) choice sets. Such a large number of choice makes the experiment extremely costly, if not unfeasible. The number of choice sets has been reduced through a fractional factorial design capable of producing forty choice sets, successively blocked into ten versions of the questionnaire[iv],each containing four choice sets. Respondents have been randomly allocated to one of the ten versions of the questionnaire and each respondent has been presented with photo-realistic images showing three product alternatives and the no-choice option (negative purchase intent) in each choice set.

The survey was carried out in Italy in March and April 2015: 800 participants have been recruited, by a market research agency specialised in conducting consumer surveys, to participate to a web-based interview. The agency actively manages a non-line panel of 45,000 members, representative of the Italian population in terms of geographical area, age, gender, education and income. Participants have been randomly selected from the panel, according to two inclusion criteria: *i)* being the household responsible for food purchasing; *ii)* having consumed oysters at home at least once during the last year. Socio-demographic characteristics of the final sample are presented in table 2.

[TABLE 2 HERE]

3.2. Investigating the relevance of certifications on consumers choices

The analysis is rooted on the theoretical framework proposed by Lancaster (1966), adopted in several applied analyses of producers and consumer choices (*e.g.* Asche et al., 2015; Santeramo et al., 2016; Baselice et al., 2017; Carlucci et al., 2017). According to Lancaster's theory, consumer utility is directly linked to the characteristics or quality attributes embedded in the products. Differentiated products are perceived by consumers as a bundle of different quality attributes which are independently valued at the time of purchase. Based on this theoretical framework, the analysis is carried out through ordered logit models capable of assessing how two relevant dimensions of the demand - the preferred location for consumption, and the frequency of consumption - are influenced by the presence of specific certifications. The findings reveal how attitudes toward food safety and environmental issues affect consumption patterns. Several control factors such as drivers and barriers related to taste, health, hygiene, expertise, perceived price, and status symbol are also included.

The preferences for location of consumption is categorized in three levels: "mainly eating out"; "mainly at home"; "both at home and eating out". Intuitively, consumers who prefer to consume oysters mainly eating out are those who consume a lower quantity of oysters, and whose consumption choices are relatively less crucial for the sustainability of the supply chain. Conversely, the attitudes of those who consume oysters both at home and eating out are those who mainly influence the sustainability of the supply chain. In a similar fashion, the frequency of consumption has been modeled with three levels of consumption behavior: less than four times per year; more than four times per year but less than once per month; more than once per month. As above, the consumption attitudes of those who consume oysters more than once per month are the most influential for the sustainability of the supply chain.

The interpretation of the models is analogous for the preferred location of consumption and the frequency of consumption: in fact the ordered logits are able to generalize the analyses of binary

logit models to multiple levels and are thus informative on the correlation among the independent variable and the dependent ones. If the outcomes cannot be ordered (for example, residency in the north, east, south, or west), ordered logits cannot be applied. In the present analysis the levels are clearly ordered and allow to conclude on consumers behavior. Analytically, in ordered logits an underlying score is estimated as a linear function of the independent variables and of several cut points: the probability of observing a certain outcome corresponds to the probability that the estimated linear function falls within the range defined by the cut points estimated for the outcome. The probability of choosing a particular alternative j is computed as follows:

$$P(Y_j = 1) = P(k_i - 1 < \sum_{p=1}^{P} \beta_p \, x_p + u_j \leq k_i) \qquad (1)$$

with u_j assumed to be logistically distributed, P standing for the number of independent variables, and k_i indicating the cutpoints (the threshold that discriminates the different outcomes of the dependent variable). Both the coefficients β_p and the cutpoints k_i are estimated via maximum likelihood estimation of the multinomial distribution.

4. *Results*

The models suggest which drivers and barriers influence consumers' choices. Positive (and statistically significant) coefficients are interpreted as drivers of consumption (table 3). In what follows it is elaborated in detail the role of drivers and barriers included as control factors.

The positive coefficients of taste and health drivers suggest that consumers who value taste and health tend to consume the product not only at home but also eating out. Conversely, consumers who are used to eat oysters are less likely to consume them eating out. The hygiene attributes, at first glance, seem to affect consumption choices: consumers who believe that oysters are not healthy ("Oysters are not healthy") tend to consume the product everywhere, while those who are worried for food safety limit their consumption at home. However, the variable "I am worried for safety" (showing a statistically significant coefficient of a similar magnitude) suggest an opposite

influence. The overall effect of the attitude towards hygiene is practically null: hygiene is not a relevant driver of consumption. The variables related to the perception of price give mixed results: depending on how the question is posed, consumers state opposite results when eating out; conversely, the higher the (perceived) price, the higher the tendency of consuming the product at home. The link of consuming oysters to a status symbol is a key driver of consumption both at home and eating out. Differently, consumers who consider oysters as a "chic" product tend to consume the product at home. Last but not least, taste is important in that consumers who care about tasty food, and those who consider taste as a relevant attribute in food consumption choices, tend to consume oysters both at home and eating out.

The analysis also explains how consumers' attitudes toward food safety issues and environmental issues influence the preferences of location of consumption. Expert consumers of oysters tend to consume them both at home and eating out. However, consumers with a specific expertise in judging the safety of the product tend to limit their consumption at home (this evidence is consistent across all three variables). It is clear that attitudes toward food safety are very important drivers in oyster market. The attitudes toward environmental issues also play a key role: consumers who care about environmental issues tend to limit their consumption, and thus (*ceteris paribus*) are more reluctant in consuming oysters both at home and eating out. It has to be concluded that labels on sustainable (and environmental-friendly) production methods may have a great potential in accelerating the transition toward a more sustainable supply chain. In order to facilitate the transition, sellers and policymakers need to pay particular care to those aspects related to the environment that guide consumers in their choices.

[TABLE 3 HERE]

Another aspect of the demand for oysters that deserves attention is the frequency of consumption: results are presented in table 4. Positive coefficients favor the evidence of a more frequent consumption of oysters. For sake of an easy comparison, the same set of variables adopted in the

previous models has been maintained, and comments are limited only to statistically significant coefficients. Contrary to prior expectations, consumers stating they like the taste of oysters ("I like oysters' taste") or those who consider the product an healthy one ("Oyster are good for health"), are not likely to consume oysters very often; differently, consumption is frequent among consumers that are used to consume oysters ("I am used to oysters"). Important barriers to frequent consumption are the attributes related to the status symbol (e.g. "Eating oysters is a life style"), as well as the variables linked to the importance of taste (e.g. "I like oysters' taste"). Frequent consumers are those who do not choose oyster for their particular taste or for their immaterial value (i.e. linked to the status symbol), but rather are those who are used to consume this product, and are probably consumers of large quantities of seafood products in general.

Interestingly, consumers who are worried for safety (e.g. "I am worried for safety" and "I eat oysters if I am sure they are safe"), are also those who consume the product more often: put differently, being concerned about safety *per se* seems not to be a friction to consume oyster often. However, consumers who are expert in judging the safety of oysters are also frequent consumers, while those who care about health are not frequent consumers. All in all, the results suggest that safety may be an issue, but it is certainly not a barrier for the segment of consumers who are able to judge oysters' safety attributes. It is therefore evident the role of adopting and communicating production and marketing techniques that may ensure elevate levels of food safety. These strategies are likely to benefit producers and sellers with a mark up and may help planners to facilitate the transition toward a more sustainable supply chain.

In analogy with previous results on the preferred location for consumption, the frequency of consumption is influenced by the attitudes toward environmental issues: in particular, the more consumers care about the environment ("I care about the environment" and "I try to preserve the environment"), the more frequent their consumption of oyster is likely to be: a further evidence on the importance of promoting the sustainability of the supply chain. Last but not least, the positive relations found between "care about the environment" and the frequency of consumption suggest

that consumers have a positive judgment on the oyster supply chain, perceived as a sustainable and environmental friendly one: a good signal that emphasize a new era of consumption patterns.

[TABLE 4 HERE]

5. *Conclusions and implications*

The recent developments in aquaculture pushed EU Commission to adopt Strategic Guidelines aimed at enhancing a sustainable and competitive sector (European Commission, 2014) and ensuring high standards of consumer protection, animal welfare, and environmental sustainability. Such a challenge reflects the global tendency of facilitating the transition of supply chains toward a more efficient sustainability in production and consumption (Schmid et al., 2012). The attention toward the use of renewable resources, and the production of bio-based products has pushed scholars to investigate how to enhance cleaner production techniques so to stimulate sustainable consumption patterns. In addition, consumers' expectations for a cleaner and more sustainable product is pushing producers to accommodate consumers' needs.

The present analysis aimed at investigating how consumers' attitudes may alter consumption choices so to conclude on how to promote cleaner, and more sustainable practices along the supply chain. The study is conducted through a choice experiment to emphasize the role of consumers' attitudes toward food safety and environmental issues on consumption choices. Two relevant aspects of consumption decisions are considered: the preferred location for consumption and the usual frequency of consumption.

First, the study confirms existing evidence that food safety is a key driver of food choices (Grunert, 2005). Second, consumers' choices are proved to be strongly affected by their attitudes toward food safety and environmental issues. In particular, consumers who care most about the environment tend to have higher consumption volumes. This result is consistent with previous studies conducted on other niche market. Third, we show that the expertise in judging food safety influences both the location and the frequency of consumption. This result reinforces previous studies on the

importance of food quality assurances in seafood markets (e.g. Wessells and Anderson, 1995).

Few further considerations are needed to interpret the findings of the present analysis. First, for niche products (such as oysters) the role of brand may fail in assuring quality, especially when the supply chain is highly fragmented[v] (as it in the case of study considered here): given the importance of attitudes toward food safety it is advisable to bridge the gap among producers and consumers by promoting the vertical integration of the supply chain. Second, given that the public supervision of control measures in fragmented supply chain (with thousands of small producers, traders and retailers) is proved to be difficult, private initiatives aimed at assuring consumers on the sustainability of the product (e.g. to flag food safety and the respect of the environment) may need attention and promotion. Lastly, due to high perishability of seafood products, often consumed in their live form without any cooking treatment, it may have been reasonable to expect a major role of concerns on food safety. Indeed, the analysis proves that consumers' attention is not only devoted to food safety, but also to environmental issues: a signal that the concept of "sustainability" is becoming a key driver in consumers' choices.

Few limitations are worth note. First, the external validity of the analysis with respect to the EU oyster market is limited by the nature of our survey, conducted on a single, yet national, market. However, the importance of oyster sector in Italy makes the analysis, if not representative, at least of particular relevance for the entire EU. Second, by interviewing only oyster consumers it has not been possible to characterize attitudes of new potential consumers of oysters (and seafood products). Indeed, such a design is particular important to characterize the existing market, and thus to conclude on effective strategies to promote its sustainability.

Understanding consumers attitudes toward food safety, and environmental issues is likely to remain an important step to ensure sustainability in agrifood markets: deepening on these aspects represents an interesting area of research.

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[i] The most important products are salmon and trout, which account for 21% and 14% of EU aquaculture, respectively (European Commission, 2014).

[ii] Closed oysters are traditionally sold in the European market and they must be opened before consumption. Pre-shucked and half-shell oysters are new preparation formats already available in international seafood markets like USA (Bruner et al., 2014), but yet almost absent in the European market. Both pre-shucked and half-shell oysters are ready-to-eat products as they are pre-opened. Pre-shucked oysters keep the two original shells together, thus appearing very similar to closed oysters, while half-shell oysters are sold with one shell only and the edible part made clearly visible.

[iii] The chosen types of certification labels resulted the most preferred, according to the participants in the pilot study. The three types of certification labels are: *i)* a safety label assuring that the product and the production process fulfil high safety standards; *ii)* a traceability label assuring that an advanced traceability system has been adopted so that the name and location of the producer is readable on the label; *iii)* an organic label assuring that the production process is free of chemical inputs (e.g. hormones, antibiotics, OGM feed, etc.).

[iv] Blocking allowed to overcome the unfeasibility of our choice experiment that contains several attributes and levels and refer to a market with relatively limited number of consumers. In particular, a D-optimal criterion was used.

[v] The feature is peculiar of other sectors such as the EU fruits and vegetable sector (Santeramo, 2015) as well as of the seafood markets in other countries (Tran et al., 2013).

Tables

Table 1 - The choice experiment design.

Attributes	Levels
Type of species	flat oysters (*Ostrea edulis*); cupped oysters (*Crassostrea gigas*)
Nationality	Italy; France; other EU countries
Dimension	small (16-30 pieces/kg), medium (10-15 pieces/kg), large (4-9 pieces/kg)
Labels	safety; traceability; organic; none
Convenience format	closed; pre-shucked; half-shell
Price (per 6 pieces)	€4.00; €6.00; €8.00; €10.00

Table 2–Descriptive statistics of the respondents' sample.

Sample size	800
Gender (%)	
Female	55.4
Male	44.6
Age(average)	*41.3*
Education (%)	
Primary	11.8
Secondary	57.8
Higher	30.4
Household size (average)	3.1
Household montly income (%)	
< 1.000 €	4.9
1.000 - 2.000 €	27.6
2.001 - 3.000 €	31.4
3.001 - 4.000 €	19.3
4.001 - 5.000 €	8.0
>5.000 €	8.8
Oysters consumption frequency (%)	
One or more times per month	30.8
Less than once per month but more than four times per year	39.4
1 – 4 times per year	29.8

Table 3 – Drivers and barriers influencing the "location choice"

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7
Taste and health							
I like oysters' taste	0.0407**	0.0734***	0.0629***	0.0772***	0.0630***	0.0839***	0.0792***
	(0.0173)	(0.0179)	(0.0182)	(0.0190)	(0.0200)	(0.0206)	(0.0207)
Oyster are good for health	0.104***	0.100***	0.0974***	0.0987***	0.0932***	0.0747***	0.0704***
	(0.0203)	(0.0205)	(0.0209)	(0.0209)	(0.0212)	(0.0216)	(0.0217)
I am used to oysters	0.0315**	0.0119	-0.0112	-0.0141	-0.0202	-0.0504***	-0.0591***
	(0.0141)	(0.0144)	(0.0149)	(0.0150)	(0.0152)	(0.0160)	(0.0161)
Hygene							
Oysters are not healthy		0.0814***	0.0607***	0.0664***	0.0761***	0.0757***	0.0787***
		(0.0140)	(0.0142)	(0.0142)	(0.0145)	(0.0148)	(0.0148)
I am worried for safety		-0.102***	-0.110***	-0.0661***	-0.0831***	-0.0945***	-0.0868***
		(0.0125)	(0.0127)	(0.0149)	(0.0152)	(0.0154)	(0.0154)
Expertise							
I am expert in oysters' consumption			0.174***	0.180***	0.185***	0.159***	0.165***
			(0.0132)	(0.0133)	(0.0135)	(0.0137)	(0.0138)
I can judge safety if oysters are close			-0.0715***	-0.0733***	-0.0679***	-0.108***	-0.0998***
			(0.0174)	(0.0175)	(0.0176)	(0.0182)	(0.0183)
I can judge safety if oysters are open			-0.0719***	-0.0658***	-0.0758***	-0.0933***	-0.117***
			(0.0179)	(0.0179)	(0.0184)	(0.0186)	(0.0187)
I eat oysters if I am sure they are safe				-0.0715***	-0.0789***	-0.0908***	-0.0998***
				(0.0150)	(0.0151)	(0.0152)	(0.0153)
Perceived price							
Oysters are very costly				0.0413**	0.0312*	0.0373**	0.0500***
				(0.0177)	(0.0181)	(0.0186)	(0.0186)
Oysters are not cheap				-0.0552***	-0.0392**	-0.0394**	-0.0644***
				(0.0159)	(0.0160)	(0.0161)	(0.0163)
Health and Environment							
I am aware of the importance of health					0.0668**	0.0778***	0.0491*
					(0.0264)	(0.0267)	(0.0271)
I care about my health					0.178***	0.150***	0.120***
					(0.0270)	(0.0273)	(0.0281)
I try to be healthy					-0.0553**	-0.0391	-0.0836***
					(0.0256)	(0.0258)	(0.0263)
Food is good for health					-0.104***	-0.0863***	-0.130***
					(0.0235)	(0.0238)	(0.0244)
I try to eat healthy food					0.241***	0.229***	0.245***
					(0.0231)	(0.0233)	(0.0237)
I care about the environment					-0.122***	-0.124***	-0.0946***
					(0.0234)	(0.0235)	(0.0238)
I try to preserve the environment					-0.0714***	-0.0657***	-0.0656***
					(0.0243)	(0.0247)	(0.0250)
Status symbol							
I want know more on oyster						0.128***	0.118***
						(0.0178)	(0.0179)
Oysters are chic						-0.0344**	-0.0439**
						(0.0170)	(0.0171)
Eating oysters is a life stye						0.101***	0.110***
						(0.0178)	(0.0180)
Eating oysters is a status symbol						0.0376***	0.0336**
						(0.0138)	(0.0139)
Taste							
Taste is important							0.0724***
							(0.0264)
I like to eat tasty food							0.203***
							(0.0217)
Constant	1.523***	1.418***	1.387***	1.356***	1.571***	1.690***	1.946***
	(0.0938)	(0.112)	(0.116)	(0.122)	(0.132)	(0.134)	(0.137)
Observations	12,832	12,832	12,832	12,832	12,832	12,832	12,832

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 – Drivers and barriers influencing the frequency of consumption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Taste and health							
I like oysters' taste	-0.0407**	-0.0734***	-0.0629***	-0.0772***	-0.0630***	-0.0839***	-0.0792***
	(0.0173)	(0.0179)	(0.0182)	(0.0190)	(0.0200)	(0.0206)	(0.0207)
Oyster are good for health	-0.104***	-0.100***	-0.0974***	-0.0987***	-0.0932***	-0.0747***	-0.0704***
	(0.0203)	(0.0205)	(0.0209)	(0.0209)	(0.0212)	(0.0216)	(0.0217)
I am used to oysters	-0.0315**	-0.0119	0.0112	0.0141	0.0202	0.0504***	0.0591***
	(0.0141)	(0.0144)	(0.0149)	(0.0150)	(0.0152)	(0.0160)	(0.0161)
Hygene							
Oysters are not healthy		-0.0814***	-0.0607***	-0.0664***	-0.0761***	-0.0757***	-0.0787***
		(0.0140)	(0.0142)	(0.0142)	(0.0145)	(0.0148)	(0.0148)
I am worried for safety		0.102***	0.110***	0.0661***	0.0831***	0.0945***	0.0868***
		(0.0125)	(0.0127)	(0.0149)	(0.0152)	(0.0154)	(0.0154)
Expertise							
I am expert in oysters' consumption			-0.174***	-0.180***	-0.185***	-0.159***	-0.165***
			(0.0132)	(0.0133)	(0.0135)	(0.0137)	(0.0138)
I can judge safety if oysters are close			0.0715***	0.0733***	0.0679***	0.108***	0.0998***
			(0.0174)	(0.0175)	(0.0176)	(0.0182)	(0.0183)
I can judge safety if oysters are open			0.0719***	0.0658***	0.0758***	0.0933***	0.117***
			(0.0179)	(0.0179)	(0.0184)	(0.0186)	(0.0187)
I eat oysters if I am sure they are safe				0.0715***	0.0789***	0.0908***	0.0998***
				(0.0150)	(0.0151)	(0.0152)	(0.0153)
Perceived price							
Oysters are very costly				-0.0413**	-0.0312*	-0.0373**	-0.0500***
				(0.0177)	(0.0181)	(0.0186)	(0.0186)
Oysters are not cheap				0.0552***	0.0392**	0.0394**	0.0644***
				(0.0159)	(0.0160)	(0.0161)	(0.0163)
Health and Environment							
I am aware of the importance of health					-0.0668**	-0.0778***	-0.0491*
					(0.0264)	(0.0267)	(0.0271)
I care about my health					-0.178***	-0.150***	-0.120***
					(0.0270)	(0.0273)	(0.0281)
I try to be healthy					0.0553**	0.0391	0.0836***
					(0.0256)	(0.0258)	(0.0263)
Food is good for health					0.104***	0.0863***	0.130***
					(0.0235)	(0.0238)	(0.0244)
I try to eat healthy food					-0.241***	-0.229***	-0.245***
					(0.0231)	(0.0233)	(0.0237)
I care about the environment					0.122***	0.124***	0.0946***
					(0.0234)	(0.0235)	(0.0238)
I try to preserve the environment					0.0714***	0.0657***	0.0656***
					(0.0243)	(0.0247)	(0.0250)
Status symbol							
I want know more on oyster						-0.128***	-0.118***
						(0.0178)	(0.0179)
Oysters are chic						0.0344**	0.0439**

						(0.0170)	(0.0171)
Eating oysters is a life stye						-0.101***	-0.110***
						(0.0178)	(0.0180)
Eating oysters is a status symbol						-0.0376***	-0.0336**
						(0.0138)	(0.0139)
Taste							
Taste is important							-0.0724***
							(0.0264)
I like to eat tasty food							-0.203***
							(0.0217)
Constant	-0.588***	-0.478***	-0.434***	-0.400***	-0.601***	-0.707***	-0.954***
	(0.0929)	(0.112)	(0.116)	(0.122)	(0.132)	(0.133)	(0.136)
Observations	12,832	12,832	12,832	12,832	12,832	12,832	12,832

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1