

Characterization of Portuguese attitudes towards innovative food technologies

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INTRODUCTION

The development of new food products and technology that satisfies consumers' demand may contribute positively as a competitive tool for food companies. Understanding consumer acceptance towards innovative food technologies is crucial to the development of successful food products. Segmentation is a crucial tool that allows a population to be divided into groups of people with similar characteristics. Namely, it allows the attitudes and behaviours of each of these 'segments' or groups to be better understood.

The aim of this work was to evaluate Portuguese consumer attitudes towards new food technologies and to segment them into specific groups.

MATERIAL AND METHODS

This research used a survey methodology. Consumers were interviewed at their households and a total of 704 questionnaires were completed in the Great Porto and Great Lisbon metropolitan areas, Portugal. Random route combined with quota sampling was employed, controlled by sex, age group and location.

The questionnaire presents a set of seven groups of questions to measure the following dimensions:

- Sensory Appeal and Food Convenience: subscales from the Food Choice Questionnaire
- Domain Specific Innovativeness
- Concerns about price/cost of food
- Food and Nutrition Knowledge*
- Food Neophobia Scale
- Food Technology Neophobia Scale
- Suspicion regarding novel foods

Seven dimensions' guide

Indication of the degree of agreement through a 7-point anchored scale, being 1 = "completely disagree" and 7 = "completely agree".

* Question iv was true or false.

RESULTS

Segmentation of Portuguese Consumers

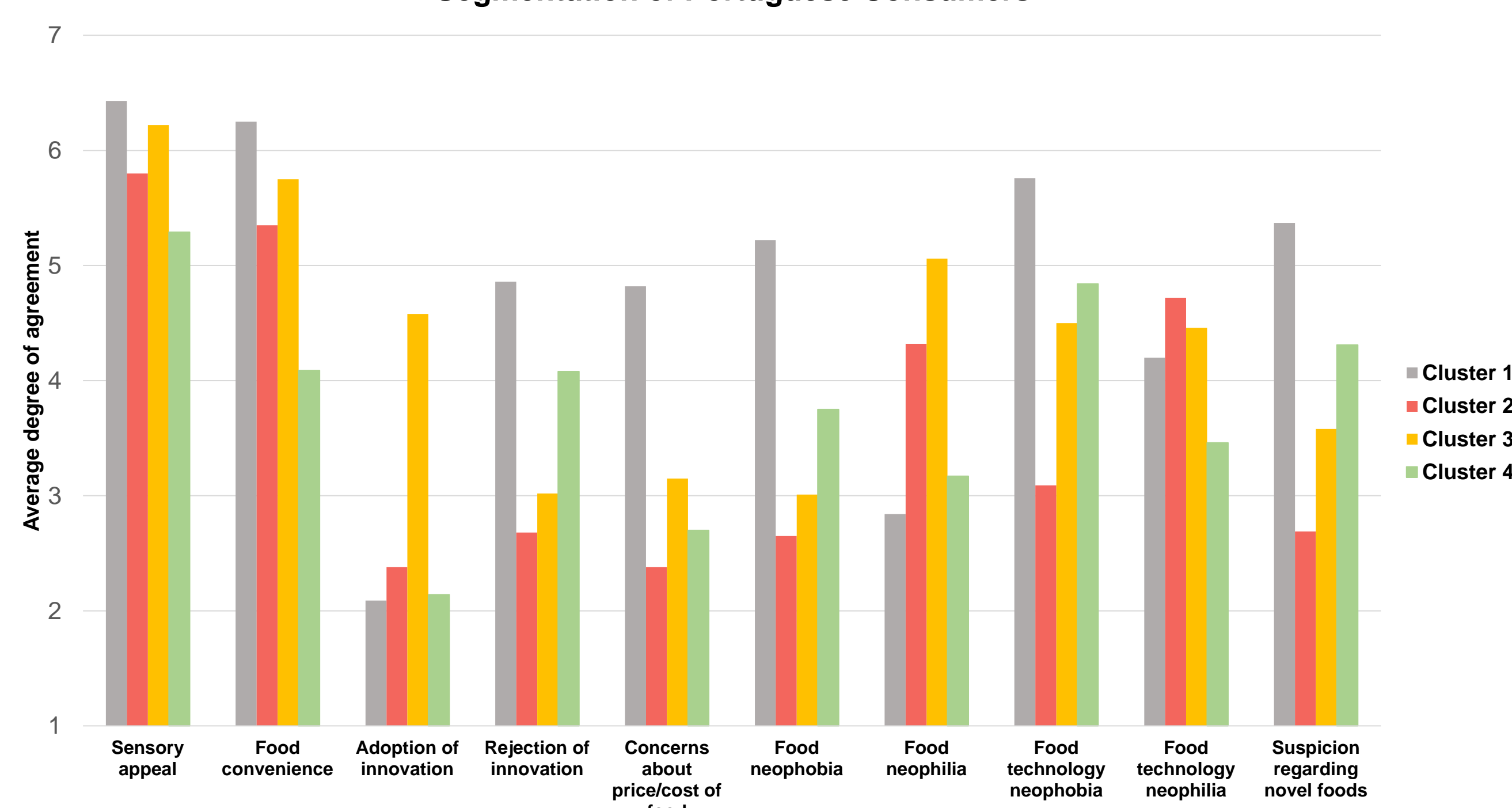


Table 1: Mean and standard error (s.e.) of mean of Portuguese consumers' attitudes towards new food technologies and F statistics for cluster differentiation

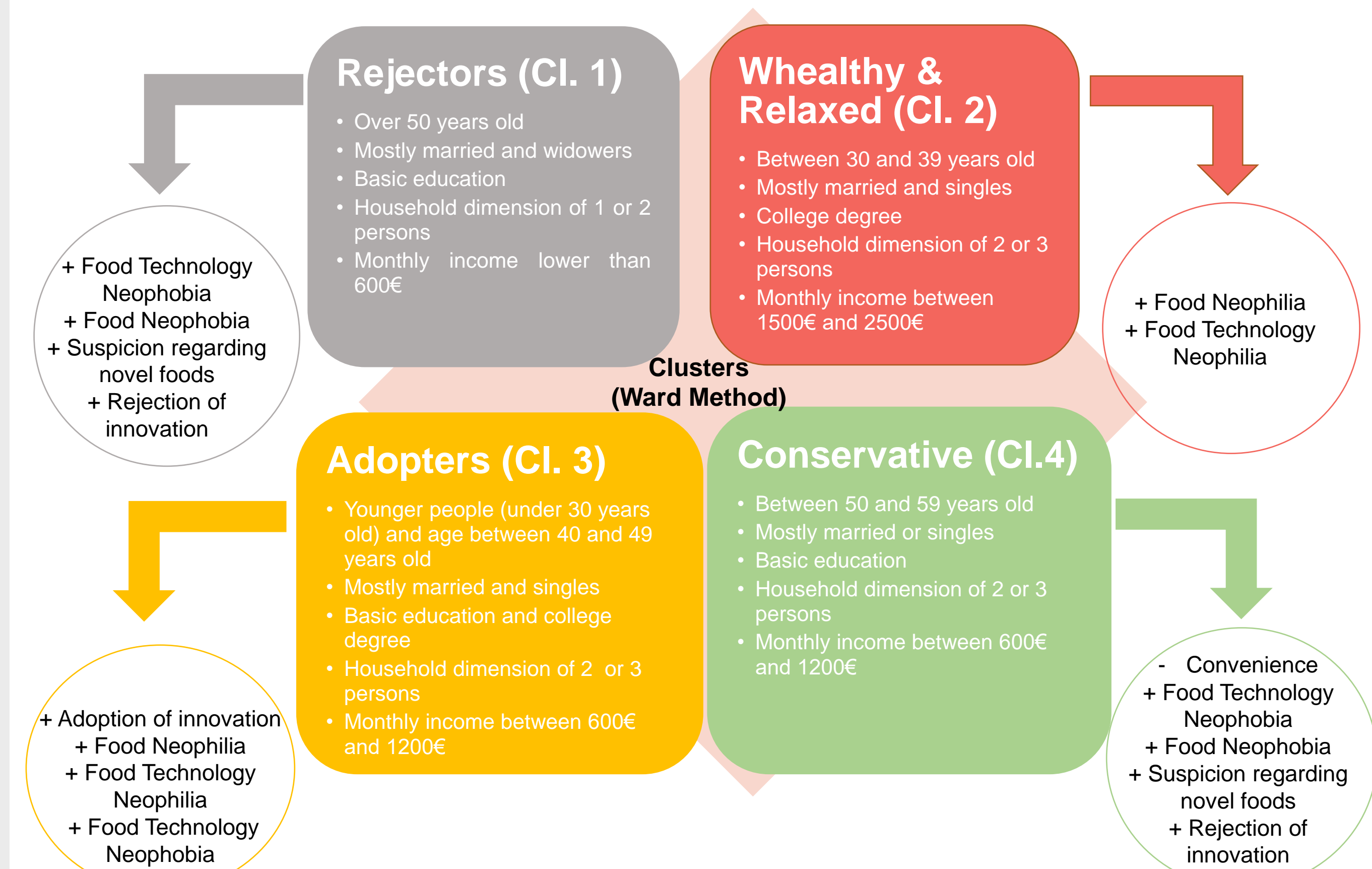
Attitudes/personality traits	F-value	Cluster 1 n = 169 Mean (s.e.)	Cluster 2 n = 185 Mean (s.e.)	Cluster 3 n = 188 Mean (s.e.)	Cluster 4 n = 160 Mean (s.e.)
Sensory appeal	43.857*	6.43 (0.06) ^a	5.80 (0.06) ^d	6.22 (0.07) ^c	5.29 (0.10) ^b
Food convenience	75.300*	6.25 (0.07) ^a	5.35 (0.10) ^c	5.75 (0.10) ^b	4.09 (0.13) ^d
Adoption of innovation	191.154*	2.09 (0.09) ^c	2.38 (0.09) ^b	4.58 (0.09) ^a	2.14 (0.09) ^{b,c}
Rejection of innovation	117.297*	4.86 (0.11) ^a	2.68 (0.08) ^d	3.02 (0.08) ^c	4.08 (0.09) ^b
Concerns about price/cost of food	133.084*	4.82 (0.11) ^a	2.38 (0.08) ^d	3.15 (0.10) ^b	2.70 (0.08) ^c
Food neophobia	183.503*	5.22 (0.10) ^d	2.65 (0.07) ^b	3.01 (0.08) ^a	3.75 (0.09) ^c
Food neophilia	160.398*	2.84 (0.08) ^d	4.32 (0.08) ^d	5.06 (0.08) ^c	3.17 (0.09) ^b
Food technology neophobia	193.545*	5.76 (0.07) ^a	3.09 (0.07) ^d	4.50 (0.09) ^c	4.84 (0.08) ^b
Food technology neophilia	27.625*	4.20 (0.12) ^b	4.72 (0.09) ^a	4.46 (0.10) ^{a,b}	3.46 (0.10) ^c
Suspicion regarding novel foods	233.150*	5.37 (0.08) ^a	2.69 (0.06) ^d	3.58 (0.08) ^c	4.31 (0.07) ^b

Table 2: Demographic characterization of each cluster.

Demographics	Cluster 1 n=169 (%)	Cluster 2 n=185 (%)	Cluster 3 n=188 (%)	Cluster 4 n=160 (%)	
Gender	Men	43.2	47.6	44.1	53.8
	Women	56.8	52.4	55.9	46.3
Age	18-29	10.1	28.1	30.3	20.6
	30-39	8.3	33.0	22.9	16.3
	40-49	12.4	11.4	18.1	15.0
	50-59	14.8	9.2	11.2	15.6
	60-69	21.9	11.9	11.2	15.6
	70-79	19.5	4.3	5.9	15.0
	>80	13.0	2.2	0.1	1.9
Marital status	Single	15.5	35.7	34.1	30.8
	Married	56.0	52.4	53.5	52.2
	Separated/Divorced	7.7	7.0	8.1	8.2
	Widow	20.8	4.9	4.3	8.8
Education level	Basic education	83.1	23.5	39.9	45.9
	Secondary education	8.4	21.9	21.3	25.2
	College degree	8.4	54.6	38.8	28.9
Household dimension	1	23.1	16.8	17.9	18.1
	2	43.8	25.9	33.5	33.8
	3	16.6	34.1	23.4	21.9
	4	10.7	16.8	14.9	18.8
	>5	5.9	6.5	10.6	7.5
Net monthly household dimension	<600€	50.4	10.8	13.2	15.0
	600€ to 1200€	36.0	28.4	36.8	48.0
	1200€ to 1500€	6.5	21.6	19.9	15.8
	1500€ to 2500€	6.5	30.4	22.1	15.8
	>2500€	0.7	8.8	8.1	5.0

Table 3: Chi-square tests (demographics)

Variables	Pearsons χ^2	df	Sig.
Gender	4.546	3	0.208
Age	47.863	9	0.000
Marital status	129.853	18	0.000
Education	141.470	6	0.000
Household dimension	29.527	12	0.000
Net monthly household income	117.398	12	0.000



CONCLUSIONS

Sensory appeal, food convenience and price were the most important dimensions regarding food choice. Portuguese consumers presented risk aversion towards food technology innovations.

Data indicate that there is little adoption of innovation among Portuguese people, combined with a high level of neophobia in relation to new food technologies, although it presents a low level of neophobia in relation to novel foods but associated with high levels of suspicion. We were able to identify four specific clusters and found clear evidence between them. The results show that certain consumer segments are more likely than others to buy food from new food technologies, such as, younger people (between 30 and 39 years old), with higher education and monthly incomes between 1500€ and 2500€. The segment of consumers with low academic levels, low monthly incomes (<600€) and age over 50 years presents high levels of food neophobia and food technology neophobia.

Great care must be taken when communicating the application of new food technologies to Portuguese consumers, to avoid new product rejection.

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