Perceptions of PDO Beef: The Portuguese Consumer

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Abstract: The objectives of this paper are to examine consumers' perceptions of Protected Designation of Origin (PDO) beef on the basis of a survey of consumers and buyers of beef. The paper identifies a profile of PDO beef consumers, examines their behaviour and perceptions on PDO beef, derives the dimensions of perceptions of PDO beef, and establishes segments based upon those dimensions.

The results reveal that PDO consumers are representative of all geographical regions, age and profession groups, are lighter consumers of beef and shop for food mainly in the butchers.

Consumers' perceptions on PDO beef emphasises quality, safety, and control. However, underlying those perceptions are six main dimensions and it is possible to identify three segments of PDO beef consumers: a faithful consumer group, an unaware consumer group, and a sensory, price conscious group.

Keywords: Protected designations of origin; beef; perceptions; factor analysis; cluster analysis.

INTRODUCTION

This paper presents results of empirical research concerned with the investigation of Portuguese PDO beef consumers. In particular the paper concentrates on consumers' perceptions of PDO beef and how these perceptions differ among groups of consumers.

The European Regulation 2081/92 which implemented the Protected Designations of Origin (PDOs) and the Protected Geographical Indications (PGIs) pursues the economic promotion of traditional food products that, by their distinct production characteristics, can be differentiated from similar products present in the market. "The promotion and commercial valuation of those products can be of considerable benefit to the rural economies, in particular to less-favoured or remote areas, by improving the incomes of farmers, by retaining the rural population in these areas, and by the contribution to the safeguard of important natural and cultural resources." (Diário da República, 1993).

Several authors (Van Ittersum, Candel, Thorelli, 1999; Letablier, Delfosse, 1995; Marreiros, 1999), agree that the European PDO labels were introduced with the aim of contributing to the market balance between supply and demand by stimulating an increase in the supply of different and better quality products. The PDO policy aims to guarantee to consumers a trustful supply that respects both sanitary rules and the features perceived by consumers as signs of quality. These features can include both nutritional and subjective properties, and allow the differentiation of the food product in the market.

According to the law that created the PDO and PGI, these kinds of products are traditional, quality products that can be differentiated from similar products in the market. Furthermore, these products, through their distinctiveness and quality are recognised and valued by consumers. In other words, "at least small segments of the market, will chose, buy, and pay more for PDO products, because they are able to fulfil specific needs, not fulfilled by other products. These ideas were also the main reason for producers to adopt PDO labels for their products", (Marreiros, 1999).

After the BSE outbreak in Portugal in 1996, beef markets suffered marked changes. In Portugal the consumption of meat increased by 21.5% over the period 1990-1997, but the share of beef in that consumption declined from 24% to 18%. However, consumption of beef increased by 10% per annum until 1995, and in 1996 declined sharply by 21%. Beef consumption is slowly recovering but has not achieved levels that existed before the BSE crisis (INE, 1999).

The Portuguese reality is not very different from the one in other European countries. According to to Gracia and Albisu (2001), beef consumption decreased by around 30% in all European Union countries, in 1996. The obvious explanation for the decline of beef consumption all over Europe is that consumers lost their trust in the production system, and without a strong guarantee of the safety of the beef, chose not to buy. A label that guarantees the origin, the characteristics, and the production system of the beef could be highly valued by consumers. According to Davies (1998), there is an increasing reliance on labels because consumers eat more processed food, the ingredients are no longer what consumers expect, shopping is done in a hurry, there is an increasing interest in health and more people ask for special diets.

After 1996 the PDOs for beef gained a new importance in Portugal. In 1997 the PDO and PGI production of beef was 1.4% of total Portuguese production (DGDRural, 1998). However, the value of this production is somehow superior because, according to the same source (DGDRural, 1998), the prices of PDO veal and steer beef were respectively 50% and 20% higher than unbranded beef. Also the number of PDO beef brands increased after 1996, so that in the year 2000 there were 12 protected Portuguese beef products. However, the fact is during the (nine year) interval since the introduction EC Regulation 2081/92, and during the six year since the introduction of the first PDO for beef in Portugal, no research has been conducted to try to understand how consumers perceive PDO beef. The aim of this paper is to answer to investigate consumers' attitudes towards PDO, the perceived image of those products and buying behaviour.

The structure of the paper is as follows. The section that follows presents a brief description of the survey method and some sample characteristics are provided. Following this, results of the analysis are presented with respect to a profile of PDO beef consumers on behaviour, preferences, and perceptions, and finally consumer segments are identified, on the basis of their perceptions. The final section presents some summary comments.

RESEARCH METHODOLOGY

The study presented in this paper was included in a larger study that employed a personal survey to investigate beef buyers and consumers' characteristics, attitudes, perceptions and buying behaviour. Within that study perceptions, attitudes, and buying behaviour relating to PDO beef were also explored. The focus of this paper is concerned with PDO beef consumers and their perceptions of beef.

Questionnaire Design

To achieve the aims of the study, the research had two main phases: an initial qualitative, exploratory phase, followed by a quantitative survey.

First, semi-structured interviews were conducted with producers' associations in charge of the commercialisation and promotion of the PDO beef in Portugal. With these interviews information about the product characteristics, positioning, and target markets was collected. During this phase quantitative data about prices and production were also gathered.

After the interviews, in order to obtain in-depth information on consumers' perceptions of the quality and of the attributes of beef and PDO beef, six focus groups were conducted. Information about claimed and intended behaviour and about consumption preferences was also explored in the focus groups. The focus groups had an average of six participants each and included people with different socio-demographic profiles. All the participants were consumers of beef and were in charge of the food shopping for their households.

The results of the exploratory research, together with a review of research issues found in the existing literature, were a major source of information for primary data collection that targetted Portuguese beef consumers and buyers.

In the context of the aims of the research and the exploratory research phase it was the questionnaire was designed to comprise three thematic sections:

- The first section was an introductory section concerned with the recruitment of the interviewees and with filter questions to facilitate the selection of the sample.
- The second section included all the questions about beef. This section was divided in four sub-sections. The sub-sections were concerned with:
  - Consumption behaviour and attitudes towards food in general.
  - Attitudes towards the consumption of beef.
  - Buying behaviour.
  - PDO beef.
- The third section of the questionnaire included socio-demographic questions that were not asked in the filter questions and were considered to be important to the interpretation of the results and the classification of the respondents.

Due to the extension of the questionnaire, the complexity of some questions, and because it was intended to investigate unprompted awareness of the PDO brands it was decided to implement the questionnaires through personal interviews. Therefore, most of the questions were made verbally, aided by the use of supplementary materials in the form of show cards. These cards were also used when it was anticipated that a particular question could be sensitive to some people, as it was the case of age and education level. The only questions that were filled by the respondents were the scale questions, because it was thought easier and less biased than if the interviewer read the statements.

The questionnaire was pre-tested first with marketing specialists and few beef consumers and then in a larger scale. Eighty-two questionnaires were applied across all age groups, professional groups, and almost all regions, defined for the sample. The aims of the pre-test were to test the questionnaires both with respondents and interviewers. In order to achieve those aims each interviewer applied two questionnaires and made a report on the interviews. The analysis of the pre-test was done based on those reports and on the results of the questionnaires.

Sample

Respondents were selected using a quota sampling method with region, age, and profession as quota control variables. The characteristics of the sample with respect to the quota variables are shown in Table 1. The categories and values for each variable were supplied by Marktest, a renowned consumer research company.

According to different authors (Verbeke, 1999; NCBA, 1998), women constitute the larger part of those responsible for food purchases within the household. Without secondary data about the profile of the consumers and buyers of beef it was judged to be reasonable to restrict the universe of the study to women over 17 years of age who eat and buy beef.

Approximately 1,120 questionnaires were completed in summer 2001. Of these, 1,039 usable replies were obtained . The non-usable questionnaires did not fulfil the quota.

Of those 1,039 questionnaires, 477 were from PDO beef consumers. The composition of the sample of PDO beef consumers is shown in the second column of Table 1. It can be seen that the PDO beef consumers were concentrated more in the Lisbon region and tend to be younger than the overall consumer. Professionals and students are also over-represented within the PDO beef consumers. This reality can probably be explained by the fact that 88% of the PDO beef is sold through the big supermarket chains (DGDR, 1998), more present in the big cities and preferred by younger working people.

Table 1 – Sample Characteristics by Region, Age and Profession

Group	Total	PDO
Region		
Greater Lisbon	21.1	**26.2**
Greater Porto	11.0	8.8
Interior North	23.0	22.2
South	11.4	11.5
Littoral North	18.2	16.8
Littoral Centre	15.4	14.5
Age		
18-34 years old	32.2	**37.1**
35-54 years old	32.4	**35.4**
More than 54 years old	35.3	27.5
Profession		
Housewife	18.8	15.1
Student	7.2	**9.4**
Retired or unemployed	27.6	23.7
Non-qualified worker	12.9	10.9
Qualified worker	9.7	10.1
Services or commerce	11.6	13.8
Technician	3.3	4.6
Small business owner	2.1	2.1
Professionals	6.7	**10.3**

EMPIRICAL RESULTS

The presentation of the empirical results is divided in three parts. First the findings related to PDO beef consumers behaviour and preferences are presented. Afterwards the discussion focuses on consumers' perceptions and beliefs of PDO beef and in the factor analysis of those perceptions. Finally an identification of PDO beef consumers segments on the basis of perceptions will be done.

Of the 1,039 respondents to the questionnaire, all beef consumers and buyers, 37.6% had heard about PDOs and 25.6% about PGIs for beef. Of the 20% who were aware of the two labels, 54.5% found it difficult to distinguish between them.

When respondents declared that they knew about PDOs or PGIs for beef they were asked to name any PDO or PGI brand that they could remember (unprompted awareness). 63% could remember at least one name; representing only 27% of the total sample. However, when consumers were shown a list with all the Portuguese PDO beef brands (prompted awareness), 83% recognized at least one name. It is interesting to note that, as much as 26.5% of the respondents know the names without realising that they were PDO or PGI. The brands in themselves have generated a bigger awareness than the official quality labels.

Behaviour and Preferences

The consumers who recognized any of the PDO or PGI names were asked if they ever eat this type of beef. 55% (46% of the total sample), acknowledged the consumption of PDO beef. Those respondents are the ones considered in this study as PDO beef consumers, and it is their behaviour, preferences, and perceptions that will be analysed subsequently.

On average PDO consumers eat beef once a week and approximately 45% declared that they had decreased their consumption of beef in the past five years. That percentage is slightly inferior (4%) to that of the total sample. However, the more important reasons stated by consumers for decreasing beef consumption are the same for PDO or non-PDO beef consumers. BSE (86%) and health (46%) were the reasons with higher scores among a list of ten reasons. These figures just confirm the impact of the BSE crisis in beef consumption. The availability in the market of a bigger variety of food products is also important reason for the reduction in beef consumption – 26% of the respondents chose this reason as one of the three more important to decrease the beef consumption.

The majority of PDO beef consumers are light consumers; 54% declared that PDO beef is less than 25% of the total amount of beef consumed, and for only 9.5% of the consumers PDO beef is the main type of beef consumed. As it is the case for the total sample, the main meat consumed by PDO beef consumers is poultry, followed by fish, pork, beef, and finally, lamb.

With respect to preferences, beef attribute importance was assessed through the pick any scaling technique, (Van Kenhove, 1995 *in Verbeke, 1999*). Respondents were confronted with a list of ten fresh beef attributes. The attributes used in the questionnaire were based on the literature review(Grunnert, 1997; Bredahl, Grunert, Fertin, 1998; Verbeke, 1999; Acebrón, Dopico, 2000), and on the exploratory qualitative research, and included freshness, amount of fat, juiciness, taste, smell, cooking method, tenderness, type of fat, cut, and safety. Respondents were asked to pick the four most important attributes and than to rank them in order of importance with respect to eating quality. The top four more important attributes for being a good beef when eating were, in descending ranking order, freshness (74%), taste (66%), tenderness (63%), and smell (38%).

In analysing the PDO beef consumers buying behaviour it is worth mentioning that 76% of consumers usually buy beef in the butchers, 24% usually buy in the hypermarkets, 20% in the supermarkets, and 11% directly to the producers. Comparison with the total sample reveals that the differences are not very important: 1% less PDO consumers buy beef in the butcher, 2% less in the supermarkets, 2% more buy in the hypermarkets, and 2.5% more buy directly to the producer.

The reasons why people buy beef from a butcher are mainly due to trust and quality. Respectively 70.5% and 53% of respondents choose these reasons, among a list of ten, as one of the three most important reasons to buy beef from the butcher. Location (51%) and convenience (70%) are the reasons why people to buy from supermarkets. People buy in the hypermarkets for convenience (83%) and because of the availability of products (40%). Price is also an important reason to buy from hypermarkets (30%). People who buy from the producer are mainly concerned with origin (93%) and quality (83%).

In order to assess preferences with respect to beef buying, respondents were shown a list of fifteen attributes among from which they chose and ranked the four most important in choosing which beef to buy. Freshness (63%), colour (52%), butcher's advice (46%), and brand or quality label (41%) were the four most important attributes that served as a guide in choosing what to buy. It is important to note that when total sample is considered, brand or quality label is chosen by only 31% of the respondents, behind cut (33%), and almost at the same level as price (28%).

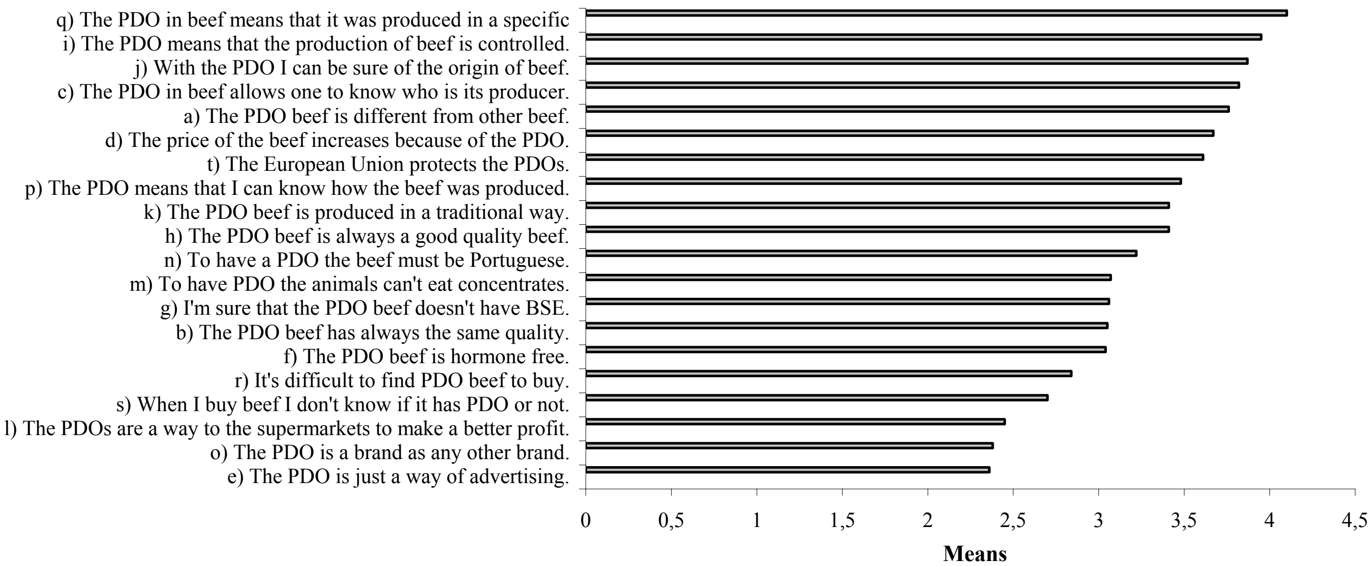
Approximately 67% of PDO beef consumers declared that they buy fresh PDO. Confronted with a list of fifteen reasons for buying fresh PDO beef, respondents chose and ranked the four most important . Quality (64%), control (62%), safety (60%), and that it is a Portuguese product (40%), were the most important reasons for people to buy PDO beef.

With these results it can be said that people evaluate beef when eating through its experience characteristics (taste, tenderness, smell) but they buy beef because of its credence properties. People rely on the label as an indicator of its quality and safety. It is also interesting to note that it is important to PDO beef to be a Portuguese product, whereas the origin of beef was not important for respondents when considering which beef to buy.

Perceptions of PDO Beef

To analyse the perceptions and beliefs on PDO beef respondents were asked to indicate their agreement or disagreement with a 20-item scale. Respondents answered each item by choosing one of five alternatives, a format proposed by Likert, as part of his attitude scaling method, (Azjen, Fishbein, 1980). The items were scored from 5 (strongly agree) to 1 (strongly disagree). The statements used in the scale were mainly derived from the focus groups and include both positive and negative items. The mean score for each item is shown below in Figure 1.

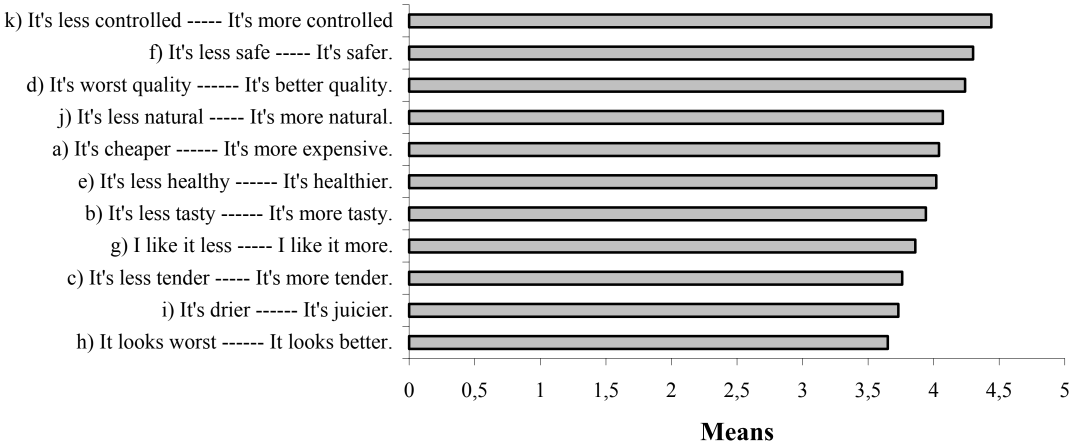
Figure 1 - Perceptions of PDO beef



Through the analysis of Figure 1 it is evident that PDOs have a positive image and that PDO beef consumers see it more as a means to trace the product and to ensure them about the system and region of production. On average people disagree with all negative statements about PDOs (statements e), l), and o)), excluding the one about price (d) where the majority of respondents agree that the PDO increases the price of the beef. However, on average, respondents are neutral to the statements r) and s). This means that 25% of the PDO beef consumers think it is difficult to find PDO beef to buy, and 26% do not have an opinion about this issue. 21% of respondents agree that they do not know if the beef they buy has PDO or not, and 22% are not sure about it. In spite of buying PDO beef because of its control and safety (see previous section), consumers are uncertain about the healthiness of PDO beef (statements g) and h)):

The perception of PDO beef compared with unbranded beef was also assessed. The beef attributes to be compared, both intrinsic and extrinsic, were accompanied by a five point semantic differential scale (Osgood, Suci, Tannenbaum, 1957), with end points associated with bipolar labels which have a semantic meaning. The scale requires the respondent to position her answer between opposite labels. The mean scores, for each attribute of PDO beef when compared with unbranded beef, are depicted in Figure 2.

Figure 2 - Comparing PDO beef with unbranded beef



Consumers' perceptions of PDO beef when compared with unbranded beef are very positive. As it can be seen the PDO beef scores are high in every attribute, with the attributes of appearance and juiciness having lower means. Control, safety and quality are the attributes with the highest means. Again PDO is perceived as a quality, controlled, safer beef, but also a more expensive type of beef.

The items in the two previous scales were further analysed to explore the existence of underlying dimensions of consumers' perceptions of PDO beef with the aid of factor analysis. According to Hair et al. (1998), the general purpose of factor analytical techniques is to find a way to summarise the information contained in a number of original variables into a smaller set of new, composite dimensions (factors) with a minimum loss of information – that is to search and define the fundamental dimensions assumed to underlie the original variables. The factors are derived sequentially so that they are uncorrelated and jointly describe the total variance of the original variables in descending order of 'importance'. The same authors argue that factor analysis provides direct insight into the interrelationships among variables and empirical support for addressing conceptual issues related to the underlying structure of the data.

The analysis was conducted using the procedure Factor with SPSS. The two scales were analysed separately and for the first one the preliminary analysis employed all the attributes and generated a solution based upon the derivation of factors according to the eigenvalue criteria. However, the communalities for the items m) and n), were judged to be quite low (<0.5) indicating that the set of derived factors explained a low proportion of the variance of those items. Consequently, the two statements were excluded from the subsequent analysis. The final solution was derived on the basis of varimax rotation, which generated a solution in six factors (Table 2).

The six factors explain approximately 61% of total variance. With respect to the communalities, all the 18 variables in the final model have communality greater than 0.50 that indicates the model explains a reasonable proportion of the variance in each variable. For instance, approximately 70% of the variance in both variables d), and g) is accounted for by the six final factor solution.

Table 2 – Varimax Rotated Factor Solution: Perceptions of PDO Beef

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Communalities
a) The PDO beef is different from other beef.	0.440	0.091	-0.091	-0.213	**0.586**	-0.028	0.600
b) The PDO beef has always the same quality.	**0.679**	0.258	0.078	-0.240	0.026	0.083	0.599
c) The PDO in beef allows one to know who is its producer.	0.033	**0.728**	-0.037	-0.001	0.142	-0.123	0.568
d) The price of the beef increases because of the PDO.	-0.105	0.068	0.140	0.182	**0.793**	-0.003	0.697
e) The PDO is just a way of advertising.	-0.076	-0.172	**0.748**	0.015	0.124	-0.019	0.612
f) The PDO beef is hormone free.	**0.645**	0.204	-0.160	0.101	0.036	-0.117	0.508
g) I'm sure that the PDO beef doesn't have BSE.	**0.697**	0.056	-0.088	0.418	-0.045	-0.122	0.688
h) The PDO beef is always a good quality beef.	**0.713**	0.188	-0.153	0.274	0.043	0.063	0.648
i) The PDO means that the production of beef is controlled.	0.214	**0.506**	-0.317	0.438	-0.118	-0.064	0.613
j) With the PDO I can be sure of the origin of beef.	0.181	**0.554**	-0.421	0.313	0.136	-0.005	0.633
k) The PDO beef is produced in a traditional way.	0.403	**0.580**	-0.119	-0.019	0.085	0.018	0.522
l) The PDOs are a way to the supermarkets to make a better profit.	0.002	-0.143	**0.735**	-0.163	0.078	0.174	0.623
o) The PDO is a brand as any other brand.	-0.202	0.128	**0.689**	0.079	-0.243	0.151	0.620
p) The PDO means that I can know how the beef was produced.	0.308	**0.718**	0.011	-0.046	-0.005	-0.039	0.613
q) The PDO in beef means that it was produced in a specific region.	0.040	0.333	-0.366	0.257	**0.455**	0.026	0.521
r) It's difficult to find PDO beef to buy.	0.000	-0.116	-0.029	-.0150	0.052	**0.831**	0.730
s) When I buy beef I don't know if it has PDO or not.	-0.053	-0.021	0.282	0.073	-0.070	**0.712**	0.601
t) The European Union protects the PDOs.	0.124	-0.006	-0.010	**0.767**	0.140	-0.051	0.625
Eigenvalue	2.478	2.296	2.174	1.404	1.353	1.316	
Variance (%)	13.769	12.754	12.077	7.798	7.519	7.310	
Cumulative variance (%)	13.769	26.523	38.600	46.398	53.917	61.227	

Examination of the strength of the correlations between the factors and the statements provides further interpretation of the dimensions. Factor 1 is strongly correlated with the statements h), g), b), and f), and is named as a "quality and safety factor". Factor 2 is strongly associated with statements c), p), j), and i) and is named "traceability". Factor 3 is associated with the negative statements e), l), and o) and is named "advertising". The only statement with strong associations with factor 4 is "The European Union protects the PDOs", so this factor is named after it. Factor 5 has strong associations mainly with the statement about the price (d), and is named "price". Finally, Factor 6 is associated with the statements r) and s) and is named information, or better the lack of it.

Moving now to the factor analysis of the comparative evaluation of PDO beef and unbranded beef, the attribute "appearance" was excluded from the final analysis because its communality in the initial solution was judged to be quite low. The final solution was derived using the eigenvalue criteria (value ≥ 1) and generated three factors (Table 3).

Table 3 - Varimax Rotated Factor Solution: Comparison of PDO and Unbranded Beef

Variables	Factor			Communalities
	1	2	3	
a) It's cheaper ------ It's more expensive.	0.060	0.067	**0.973**	0.955
b) It's less tasty ------ It's tastier.	**0.827**	0.122	0.134	0.716
c) It's less tender ----- It's tenderer.	**0.806**	0.055	0.059	0.656
d) It's worst quality ------ It's better quality.	0.365	**0.601**	0.185	0.529
e) It's less healthy ------ It's healthier.	0.280	**0.748**	-0.027	0.639
f) It's less safe ----- It's safer.	0.068	**0.878**	0.003	0.776
g) I like it less ----- I like it more.	**0.641**	0.292	0.036	0.498
i) It's drier ------ It's juicier.	**0.793**	0.121	-0.088	0.651
j) It's less natural ----- It's more natural.	0.459	**0.585**	-0.116	0.566
k) It's less controlled ----- It's more controlled	-0.046	**0.795**	0.101	0.645
Eigenvalue	2.805	2.788	1.036	
Variance (%)	28.046	27.885	10.357	
Cumulative variance (%)	28.046	55.930	66.287	

The three factors explain approximately 66% of the total variance. Examination of the strength of the correlations between the factors and the statements provides further interpretation of the dimensions. Factor 1 is strongly correlated with taste, tenderness, juiciness, and the overall evaluation of "liking", consequently, is named "sensory" factor. Factor 2 is strongly associated with safety, control, health, quality' and naturalness, and is named "safety and quality factor". Finally, Factor 3 is strongly associated only with the attribute price, so is named "price" factor. It is worth to note that in the analysis of both scales quality is associated with the safety and health issues, rather than with the sensory attributes.

Segmentation

In order to explore the existence of sub-groups of PDO beef consumers on the basis of their perceptions and beliefs on PDO beef, the data was analysed by using cluster analysis of the factor scores generated by the first factor model presented in the previous section. The first model was chosen because there is more variability among respondents with respect to their perceptions and beliefs on PDO beef than in the compartive evaluation of PDO beef and unbranded beef.

Cluster analysis groups individuals or objects into clusters so that the objects in the same cluster are more similar to each other than they are to objects in other clusters. The attempt is to maximize the homogeneity of objects, with respect to some predetermined selection criteria, while also maximising the heterogeneity between the clusters (Hair et al. 1998) . The procedure employed in the analysis was a non-hierarchical procedure in which objects are assigned into clusters once the number of clusters to be formed is specified. The first step in this procedures is to select the initial cluster center (co-ordinates defined by the values of the variables), and all objects within a pre-especified thresold distance are included in the resulting cluster. Then another cluster center is chosen, and the assignement continues until all the objects are assigned. Objects then may be reassigned if they are closer to another cluster than the one originally assigned (Hair et al., 1998).

The analysis clustered PDO beef consumers into three groups on the basis of their six factor scores. Table 4 presents a summary of the cluster centres and one-way tests for the difference between clusters centres. The results indicate that these six factors have significantly different patterns in differentiating between groups, consequently the criteria used to cluster the PDO beef consumers (the factors) can be considered meaningful.

Table 4 - Cluster Analysis of PDO Beef Consumers

Cluster centres

	Cluster		
	1	**2**	**3**
Factor 1 - Quality and Safety	0.16099	-0.60281	0.19262
Factor 2 – Traceability	-0.07161	0.39749	-0.17441
Factor 3 – Advertising	-0.07169	0.92142	0.53366
Factor 4 - European Union	-0.21449	0.36465	0.04412
Factor 5 - Price	-0.20109	0.40460	0.55337
Factor 6 – Information	-0.78265	0.44246	0.77016
Cluster size (%) n= 477	45	22	33

Significance tests for differences between clusters

	Cluster		Error			
Variables	Mean Sq.	df	Mean Sq.	df	**F**	**Sig.**
Factor 1 - Quality and Safety	25.108	2	0.898	474	27.951	.000
Factor 2 – Traceability	11.374	2	0.956	474	11.895	.000
Factor 3 – Advertising	68.186	2	0.717	474	95.164	.000
Factor 4 - European Union	12.188	2	0.953	474	12.792	.000
Factor 5 - Price	36.969	2	0.848	474	43.584	.000
Factor 6 – Information	122.282	2	0.488	474	250.443	.000

The next step in the analysis is to profile the clusters. According to Hair et al. (1998), profiling the clusters is the way of considering the practical significance of the clusters in meenting the objectives of marketing segmentation. A profile of each of the three groups is established from the average factor scores for each group and from the identification of demographic, behavioural, and percept ional variables for which there are significant differences between groups on the basis of a chi-square contingency test at a 5% level of significance.

Cluster 1 is the biggest cluster, with 45% of the PDO beef consumers, who can find and know when they are buying PDO beef; Factor 6 has the more negative value in this cluster. These consumers associate PDO with the quality and safety of beef (Factor 1), and they do not think that the PDO increases the price of beef (Factor 5). Cluster 1 represents a group of consumers who are more knowledgeable about PDOs and PGIs, they tend to have a bigger degree of awareness about those labels and the different brands. These consumers are characterised by higher education levels and live predominantly in Lisbon and in the south of Portugal. They are heavier consumers of beef and PDO beef than the consumers in the other clusters. PDO beef represents, on average, 25 to 50% of the total amount of beef Cluster 1 consumers eat, and they tend to eat it, predominantly, at home. Consumers in Cluster 1 tend to buy beef more in supermarkets and hypermarkets and they can be labelled as "the faithful consumers".

Cluster 2 consumers, 22% of the total number of consumers, are the ones with a more negative image of PDOs. They think PDOs are just a way of advertising; they have the higher scores for Factor 3. This group of consumers associates the PDOs in beef more with traceability (Factor 2) than with quality and safety (Factor 1). They agree that the PDO increases the price of beef and they do not know if they are buying PDO or not and where to find it (Factor 6). Cluster 2 consumers live in Porto and in the north of Portugal and they are medium consumers of beef. Just a small proportion of consumers in this cluster buy beef in the supermarkets and hypermarkets. They are light consumers of PDO beef and tend to eat it in restaurants. Cluster 2 consumers tend to have the smallest degree of awareness about PDO and PGI beef brands. Because of this lack of in formation these consumers can be labelled the "unaware consumers".

Cluster 3 consumers, that represent 33% of the total PDO consumers, have mixed perceptions of PDO beef. These consumers tend to have higher scores in factor 6, which means they think it is difficult to find PDO beef to buy and to know if the beef has PDO or not. They think PDO beef is expensive (Factor 5) and a way of advertising. However, at the same time, Cluster 3 consumers associate PDO with quality and safety; consumers in this clusters tend to have the highest scores in Factor 3. Cluster 3 consumers are characterised by lower levels of education and they live in the rural north of Portugal. They are the lighter consumers of beef and, also, they do not buy beef in the supermarkets and hypermarkets. They eat small proportions of PDO beef and predominantly in restaurants. Cluster 3 consumers are more aware of the PDO and PGI labels and of the different brands in the market than Cluster 2 consumers. However, the main difference between Cluster 2 and 3 consumers is that consumers in Cluster 3 make a more positive evaluation of PDO beef than people in Cluster 2. They think PDO beef is better than unbranded beef both in the sensory attributes and in the safety attributes, but they are also the group of consumers who thinks more that PDO beef is more expensive. This group of consumers is labelled the "hedonic, price conscious consumers".

In conclusion, the differences among the clusters are stronger on the first, third, and sixth dimension. On the contrary, dimension Traceability, European Union, and Price have less delineation among the clusters, even though they are statistical significant. This should focus managerial attention on consumer information about quality and safety, and also on availability of the PDO beef. Half of the PDO beef consumers (Cluster 2 and 3) do not really know, when they are buying beef, if it has PDO or not, and also they do not know the meaning and of the PDO labels. Cluster 1 consumers are informed consumers who buy more PDO, mainly because they perceive it as a safer quality beef.

SUMMARY

The objectives of the study presented in this paper were to examine the nature of consumer perceptions of PDO beef on the basis of a survey of beef consumers and buyers. The study provides a contribution to research which has not been addressed in Portugal and which is still developing in other European Union countries.

The study reveals a detailed profile of the PDO beef consumer and its behaviour. It identifies the most important attributes used by consumers to evaluate and to buy beef and PDO beef. The study also provides some insight into the perceptions of PDO beef and how is it perceived compared to unbranded beef. Furthermore, it has shown that the attributes reveal a hierarchy of underlying dimensions from which to understand consumers' perceptions of PDO beef and which form a basis for market segmentation.

The PDO beef consumers represent 46% of the consumers of beef. However they are light consumers of beef and PDO beef, who have decreased their consumption in the past five years. PDO beef consumers are representative of all geographical regions, age, and profession groups. However, they are slightly more concentrated in the Lisbon region and in younger groups of students and professionals. For consumers 'eating quality' refers to a fresh, tasteful, tender beef, and consumers make their choice of beef in the shop according to its freshness, colour, butcher's advice, and brand or quality label. PDO beef buyers (67% of the PDO beef consumers) buy the product because of its quality, control, and safety.

In spite of the ever-growing dominance of the big supermarket chains in food markets consumers still prefer to buy meat, particularly beef, in the butchers, mainly, because they trust the butcher and because of the quality of the products. People buy in supermarkets and hypermarkets more for convenience and price.

Underlying the attributes of PDO beef, when compared with unbranded beef, are three main dimensions of sensory, quality and safety, and price. PDO beef scores higher for all the dimensions. For PDO consumers quality is always more associated with the attributes related to health and safety than with the sensory and typical attributes. This result can inform producers to improve the positioning of their products in the market in a time where the main concerns of food consumers are precisely health and safety related issues.

The beliefs and perceptions on PDO beef have six underlined main dimensions, quality and safety, traceability, advertising, European Union, price, and information. Additionally it is possible to identify three segments of PDO consumers in terms of a faithful consumer group, an unaware consumer group, and a sensory price conscious group. More than one half of the PDO consumers lack information and are uncertain about the PDO labels. This fact leaves this segment of the market very vulnerable to competition in spite of the overall good evaluation that consumers have of the PDO beef.

Most of the producers associations who market the PDO beef are small businesses with limited human, financial, and technological resources. The authors would like to think that this study has contributed valuable information to those associations and their producers.

The study employed a questionnaire, which was designed to investigate the behaviour and attitudes towards beef and PDO beef. The non-statistical nature of the sample limits the conclusions of the study, although it should be emphasised that the dimension of the quota sample employed in the study allows some generalisation of the results.

Further research in this area would contribute to a more general understanding of the marketing of PDO products. A direction for future research would involve a wider coverage of food products and to investigate in more detail product benefits and the nature of the PDO consumer behaviour.

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