A cross- cultural study of cereal foods' quality perception

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Abstract. Cereal foods' production and use show substantial heterogeneity across Europe. For a category central in most EU diets, cereal foods' quality perception is, nevertheless, surprisingly understudied. With this in mind, 357 Danish, Lithuanian and Portuguese citizens were inquired about the importance of several cues and dimensions in their evaluation of the perceived quality of bread, cookies, breakfast cereals, pasta and vodka. Portuguese and Lithuanians consistently gave a significantly higher average importance to all the cues and quality dimensions considered, for all products, than their Danish counterparts. Nevertheless, respondents in all three samples found expected quality dimensions to be much more important than both extrinsic and intrinsic cues across almost all product categories. Dimensions and cues like *taste* and *country-of-origin* were the most relevant to Lithuanians, while *taste*, *label information* and *price* were the most important for Danes. The cues and dimensions Portuguese found relevant were fairly different and more category-dependent. Cues like *store type* for bread, *brand* for breakfast cereals, pasta and vodka, *country-of-origin for vodka*, and *price* for cookies, pasta and vodka were more often assessed by the Portuguese as relevant for decision-making at the point-of-purchase. This highlights the need for further cross-cultural research on food quality perception.

Keywords: Cereal Foods, Consumer Quality Perception, Total Food Quality Model, Cross-cultural Study

1. Introduction

There has been a long-standing interest in cross-cultural studies in the food area [1-4]. However, only few studies have attempted to compare the quality perception of foods of consumers of different European nationalities. Moreover, these studies have typically focused on the differences between consumers of Europe's largest countries and their perceptions of the quality of a handful of flesh foods. The overall aim of the present cross-cultural study is thus to address that knowledge gap by investigating the quality perception of nationals of three small, idiosyncratic EU countries – Denmark, Lithuania and Portugal – regarding a food category which has not often been the object of consumer research studies – cereal-based products.

Denmark is the typical example of a small, fully EU-integrated country which is mainly a social market economy [5], whereas Lithuania can best be viewed as a post-socialist economy undergoing major transformations, as it carries on its process of integration in the Single European Market (EU) [6]. Portugal, on the other hand, has joined the European Union in 1986 and has been since then orientating its economic policy towards a full convergence with the European single market model [7]. Regarding socio-cultural aspects, the striking feature of Lithuania's

contemporary history is, naturally, the intensity of the influence of the Soviet Union's presence for decades in this Baltic country, which can still be felt in multiple facets of its culture and society. Exactly how far has this influence spread to more mundane and stronger aspects of any native culture, such as food consumption and quality perception, remains largely unknown. Denmark is, in turn, both geographically and culturally, a Nordic country which possesses a strong national identity, and, what is more important for consumption studies, a very successful tradition as a large manufacturer and exporter of food products [8]. Finally, Portugal can be best typified as a South European country with many of the features of Mediterranean societies, including a very strong and all-encompassing influence of food and eating in daily life, and yet some idiosyncrasies deriving from its Atlantic location and its past as a maritime power [7].

Cereals have constituted the basis of animal and human diets since the dawn of sedentary civilisations. Consequently, they have also been one of the most important agricultural commodities produced and traded world-wide are omnipresent in the food and feed industry alike. The production of cereals in Europe reached 290.256.510 tones in 2004, rising by about 13% in the last ten years [9]. Not all EU countries have, however, been equally proficient in producing this commodity. Portugal's cereal production has, for instance, been typically rather low (1.213.773 thousand tonnes in 2004), especially when compared to that of Denmark (8.803.706 thousands tones) and Lithuania (2.539.100 thousands) for the same period [10-12]. Mainly as a result of unfavourable geographic conditions and misguided sector policies, Portugal has been mostly a lead importer of cereals and grains, and not a producer, like Lithuania and Denmark. About 15 % of agro-food imports of Portugal are cereals, most often originating form Canada. Cereal-based food consumption in Portugal remains one the highest of the European Union, at the same level of that of countries like Greece and Lithuania (around 130 kg per capita in 2004) [10-11]. The consumption of cereal-based products in Denmark is, conversely, much lower than in these two countries. Such a low consumption of cereal foods can perhaps be better understood when considering the traditional high importance of the animal foods production sector in this country. Nevertheless, the market for bakery and cereal products in Denmark has been steadily increasing, and displaying an average growth rate of 3.8% in 2004. This clearly indicates an increasing demand for cereal based-foods in the country [12].

An extensive body of research has been gathered about several conceptual and empirical aspects of consumers' food quality perception, as well as its relation to food consumption behaviour [13-17]. In spite of this, the consumers' perception of cereal foods' quality is remarkably understudied. Having in mind the overall aim of our study, this paper is structured as follows. First, the theoretical framework and the conceptual model underlying the present study's approach to food quality perception are described. Next, the methodology employed in the study's empirical part – a self-administered, cross-cultural survey -, is outlined. Thirdly, the main results of this survey are presented. Finally, the study's findings and their implications for both academicians and practitioners in the agri-food research area are discussed.

2. Theoretical framework

This study applies the Total Food Quality Model (TFQM), originally proposed by Grunert, Larsen, Madsen, and Baadsgaard [17], as an overall conceptual research framework [18, 19]. TFQM distinguishes between quality perception 'before' and 'after' purchase. Dimensions of quality are commonly categorized into search, experience and credence characteristics [20]. Many characteristics of a cereal-based product, for instance, such as taste, cannot be ascertained before purchase. *I.e.*, most such products have only search characteristics to a limited degree. In order to make a choice, the consumer will develop expectations about quality - but it is only after consumption that experienced quality can be determined, and even this is limited in the case of credence characteristics like the healthiness of a product. The distinction between before and after purchase thus forms the basis of the TFQM. In the before purchase part, the model shows how quality expectations are formed based on the quality cues available. Cues are pieces of information used to form quality expectations [20]. The intrinsic quality cues cover the physical characteristics of the product, including packaging. The extrinsic quality cues represent all other characteristics of the product, such as brand name, price, store type, label information, information on origin, etc.

According to the TFQM, quality is not an aim in itself, but is desired because it helps to satisfy purchase motives or values. The model therefore includes motive or value fulfilment, *i.e.*, how food purchase and consumption contribute to the achievement of desired consequences and values. Extrinsic cues such as a label and its content may, for example, generate expectations about exceptionally high eating quality—giving the consumer a feeling of luxury and pleasure in life. The values sought by consumers will, in turn, have an impact on how quality dimensions are sought and different cues are perceived and evaluated. Expected quality and expected fulfilment of purchase motives constitute the positive consequences consumers expect from buying a food product, and are offset against the negative consequences in the form of various (mostly monetary) costs. This trade-off determines the intention to buy. After purchase, consumers will have a quality experience, which often deviates from expected quality, especially when it is based on quality cues with a low degree of predictive power. The relationship between quality expectation and quality experience (e.g. before and after purchase), is commonly believed to determine product satisfaction, and consequently the probability of purchasing the product again.

Figure 1 shows the adopted TFQM framework for quality perception of cereal-based products which underlies the present research study. Three main components of this adopted model were hypothesized as being relevant for the research aims pursued – extrinsic quality cues, intrinsic quality cues and expected quality. Due to practical constraints, the empirical research envisaged for the current study did not encompass product trials. Consequently, the part of the original TFQM dealing with experienced quality, confirmation/disconfirmation of expected quality and motive fulfillment, has not been taken into consideration in the design of the survey instrument.

3. Methodology

The cereal-based product categories *bread*, *cookies*, *breakfast cereals*, *pasta* and *vodka* were selected for analysis in the context of the present research study. This particular set of products ensured that different staple/non-staple foods, new/traditional foods and national/imported products were sufficiently represented. Given that there were few published sources reporting on European consumers' quality perceptions of cereal-based products upon which to base the survey study, its empirical part started with the performance of in-depth interviews with consumers of the three countries involved. Five, 90-minute interviews were conducted with national citizens of each country recruited through the snowballing technique among the staff and students of local universities. The interviewees, both male and female, aged 25 to 30 years old and with a medium to high education level, were asked about the cues and attributes they found important when evaluating the expected and experienced quality of the different foods under study. The outcome of the interviews served as the main input for the design of the survey instrument.

A pilot questionnaire was developed and pre-tested with 10 respondents in each country, once more sampled from staff and students of local universities. This questionnaire was originally developed in Lithuanian and translated into English. Based on the English version, questionnaires in Danish and Portuguese were then designed and compared with the Lithuanian original. Finally, the results obtained with three types of questionnaires were back-translated into English for analysis. The whole process of design, translation, back-translation and analysis of the pilot questionnaire was conducted by native speakers of the Danish, Lithuanian and Portuguese languages. As a result, some changes were made in the questionnaire's introduction that reflected the different cultural sensitivities to issues of anonymity and confidentiality of answers, namely in what respected the socio-demographic variables surveyed. Regarding the Portuguese questionnaire, one of the expected quality attributes - *ecological* - was transformed into the attribute *biological*, given that the association between the term *ecological* and cereal based food products was not to be a common one amongst respondents in the pilot survey.

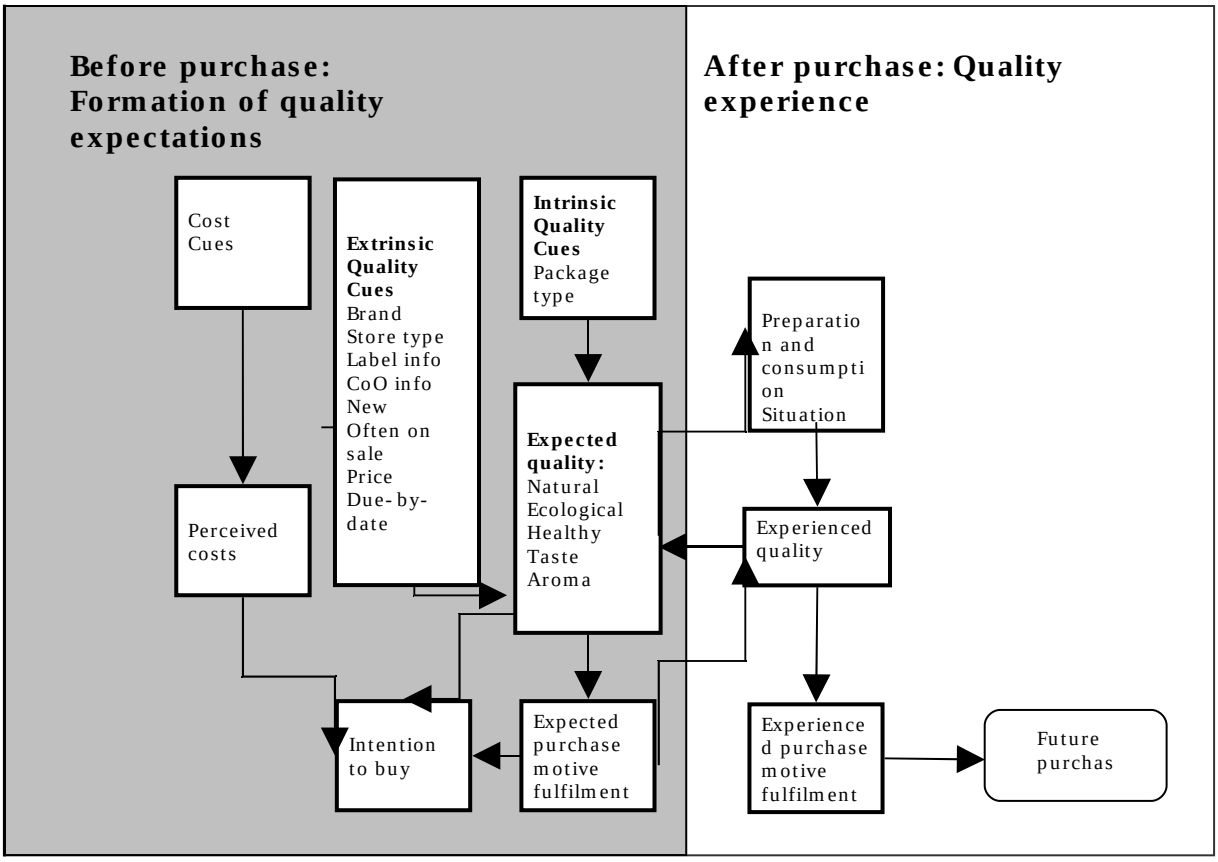

Figure 1. Adopted Total Food Quality Model (originally proposed by Grunert et al. 1996) for quality perception of cereal-based foods. The specific cues and dimensions depicted were selected based on the results of an exploratory interview study detailed in section 3 of this paper.

The final survey instrument began by asking respondents to name the type of products they most frequently consumed within each of the 5 cereal-based products' categories considered – bread, cookies, breakfast cereals, pasta and vodka –, as well as the top-of-mind countries associated with each category. Next, and in order to obtain an indication of the use of price as a cost and/or quality cue, respondents were asked to state their level of agreement with the following items:

- *The price of foods is a cost I try to minimize*
- *Price is an indicator of food quality*

These items were rated on a five-point Likert-type scale ranging from *1 = strongly disagree* to *5 = strongly agree*. Subsequently, respondents were asked to rate the perceived importance of the extrinsic quality cues, intrinsic quality cues and expected quality dimensions considered in this study's research model (Figure 1) on a five-point scale ranging from *1 = extremely important* to *5 = not at all important*. Finally, data regarding socio-demographic variables such as gender, age, income, education level and occupation were also collected.

Data were gathered in Denmark and Lithuania during the spring of 2004 and in Portugal at the end of 2005, through the collection of self-administered questionnaires. Data collection in Lithuania focused on respondents living in Vilnius and Kaunas, the two biggest cities in this country, whereas in Denmark the

respondents were recruited within the countries' three biggest cities – Copenhagen, Aarhus and Aalborg. As for Portugal, respondents from the capital city of Lisbon and Évora, a middle-sized city in the southeast of the country, were recruited. A convenience sampling approach was followed, which aimed at obtaining representative samples of the national adult populations of the three countries in terms of gender and age. One-hundred and fifteen valid questionnaires were obtained in Denmark, while the surveys in Lithuania and Portugal yielded 166 and 76 valid questionnaires, respectively.

The socio-demographic characteristics of the three respondent samples was analyzed employing descriptive statistical techniques. Whether or not these samples could be considered representative of their countries' population in terms of gender and age distribution was investigated by comparing the samples' distributions to those supplied by the national statistics of the respective countries for the year 2004. The answers to the questionnaire's open-ended questions were content-analyzed [21], and the type of products usually consumed by the respondents categorized and quantified. Finally, the answers to the questionnaire's closed questions, *i.e.*, those concerning the importance of the different quality cues and dimensions considered for the various cereal products surveyed, were also submitted to a descriptive statistical analysis. The existence of statistically significant differences between the Danish, Lithuanian and Portuguese samples regarding mean cue/dimension importance for the different products was investigated through the performance of one-way ANOVA and multiple comparison tests (Tukey's HSD and Tamhane's T2 when equal variances across samples could not be assumed). All of the statistical analyses described were carried out with SPSS 13.0 for Windows software package.

4. Results

4.1. Socio-demographic characteristics of the Lithuanian, Danish and Portuguese samples

In all three country samples, more than half respondents were women, over 85% had a middle or high education level and over 63% had a paid job in the tertiary sector. Only 35% of Danish respondents were older than 45 years, while in the Lithuanian and Portuguese samples these percentages were slightly higher – 40 and 45%, respectively. It was verified that the gender distributions of the Danish, Lithuanian and Portuguese samples were not significantly different (Denmark: $\chi_{(1)} = .247$, $p=.619$; Lithuania: $\chi_{(1)} = .886$, $p=.347$; Portugal: $\chi_{(1)} = .794$, $p=.373$) from those of the respective national populations in 2004. A similar outcome was obtained in regards to the age distribution of the Lithuanian sample ($t_{165} = -1.703$, $p=.09$). However, there were significant differences between the age distribution of the Danish and Portuguese samples and those of the respective national populations (Denmark: $t_{114} = -6.485$, $p<.001$; Portugal: $\chi_{(2)} = 13.545$, $p < .01$). Namely, our Danish sample contained younger respondents (18-35 years old) in a higher proportion than the Danish population in 2004, while our Portuguese sample contained significantly less respondents in the age class 18 to 24 years old than the respective national population in 2004.

4.2 Consumption of cereal products and top-of-mind associated country

Table 1 depicts the type of cereal products consumed and associated country in each category as reported by the Lithuanian, Danish and Portuguese respondents. From the results obtained for the bread category, it can be easily seen that while respondents from both Northern countries reported to consume mainly rye-based bread - alone or in combination with other types of bakery products -, their Portuguese counterparts reported to eat mainly wheat-based bread. However, and in contrast with the Danish respondents, Lithuanians and Portuguese recalled more often the type of bread they consumed either by its brand name or region of origin, respectively, than by the main cereal ingredients. All three nationalities overwhelmingly associated bread with their home countries, although some Danish and Portuguese respondents linked this category with countries like France and Italy. This is probably related to the relatively wider assortment of the so-called 'international' bakery products (e.g. 'ciabbata', 'baguette', etc.) present in Danish and Portuguese retail stores.

A high number of Danish respondents stated not to eat cookies regularly. Those who did, reported eating mostly a varied assortment (oatmeal, chocolate, with raisins, etc.), which included homemade cookies. Conversely, in the Lithuanian sample, product recall was higher for region of origin and brand name than for type of ingredient. Brand name was equally often used by the Portuguese to describe their consumption of these products, although they stated to consume fibre-enriched cookies the most frequently. The cookies' category was again highly associated with the respondents' own country, though to a lesser extent than the bread category.

The consumption of breakfast cereals was clearly more frequent amongst the Danish respondents than the Portuguese and Lithuanian ones, with 35% and 42% of the latter declaring themselves as non-regular users of this type of products. Muesli and corn-flakes were respectively often reported to be the preferred type of breakfast cereals for both the Danish and the Lithuanian samples, although most Danes declared to eat oatmeal porridge the most frequently. Portuguese referred to the breakfast cereals they usually ate mostly by their brand name or otherwise distinguished them based on their fibre content, a distinction also occurring often among the Danish respondents. Probably due to their relatively high consumption within this category, the Danes associated it mostly with their own country, while the Lithuanian and Portuguese respondents linked breakfast cereals most often to countries like Germany, and the United States or the United Kingdom, respectively. Nevertheless, a relevant percentage of the Danes also associated this product category with the United States.

Table 1. Type of cereal products consumed and associated country as reported by the Lithuanian (n=166), Danish (n=115) and Portuguese respondents (n=76).

	Lithuanians		**Danish**		**Portuguese**	
	Product	**Country**	**Product**	**Country**	**Product**	**Country**
Bread	Branded *34%* Dark bread *31%* Regional *12%*	Lithuania *98%*	Rye + white bread *33%* Rye bread *28%* Rye bread + whole grain	Denmark *73%* Italy *13%* France *10%*	Regional *41%* White + whole grain *16%* White bread	Portugal *89%* France *11%*

			16%		*15%*	
Cookies	Regional *30%* Branded *24%* Assorted *22%*	Lithuania *61%* Germany *11%*	None *32%* Assorted *19%* Homemade *16%*	Denmark *79%* U.K. *9%*	Fiber- rich *37%* Branded *22%* Chocolate *19%*	Portugal *40%* Spain *19%* U.K. *10%*
Breakf. cereals	None *42%* Muesli *18%* Cornflakes *13%*	Germany *32%* USA *29%* Lithuania *10%*	Oatmeal *37%* Muesli *21%* Fiber- rich *14%*	Denmark *57%* USA *27%*	None *35%* Branded *26%* Fiber- rich *15%*	USA *32%* Portugal *24%* U.K. *17%*
Pasta	Origin *36%* Dry pasta *25%* Spaghetti *19%*	Italy *65%* Lithuania *29%*	Dry pasta *69%* Fresh pasta *16%* Spaghetti *15%*	Italy *96%*	Dry pasta *59%* Spaghetti *27%*	Italy *76%* Portugal 24*%*
Vodka	None *33%* Regional *28%* National *26%*	Lithuania *49%* Russia *42%*	None *39%* *Smirnoff 25%* Branded *37%*	Russia *79%* Poland *10%*	None *67%* Branded *16%* *Absolut 6%*	Russia *96%* Finland *2%*

Danish and Portuguese respondents stated to consume different types of dry pasta, including *spaghetti*, the most often. Nevertheless, the percentage of Danes who declared to use fresh pasta often was also fairly high. Dry pasta consumption was also frequently mentioned by the Lithuanian respondents as well, whom nevertheless recalled their consumption mostly in terms of the product's associated country- of- origin – most frequently Italy for all three samples. In spite of this, many Lithuanians still associated this category with their own country, as did a fairly significant percentage of the Portuguese respondents.

An important share of respondents in all three samples, especially in the Portuguese one, declared not to drink vodka on a regular basis. Similarly, recall of the type of vodka consumed by all three samples was overwhelmingly based on brand name. However, being citizens of a country that produces significant amounts of this spirit, Lithuanian respondents recalled much more often their national and regional brands than internationally- known ones. They also associated this category mostly with their own country. The opposite was observed for the Danes and the Portuguese: these respondents recalled known brands the most often, brands which they associated overwhelmingly with Russia, in spite of at least one of then being actually produced in a Nordic country.

4.3 Use of price as cost and/or quality cue in the formation of quality expectations

Table 2 presents the results of the statistical analysis of the respondents' answers to the questions concerning the use of price as a cost and/or a quality cue in each of the surveyed countries. Both the Danish and the Lithuanian respondents seemed equally inclined to agree that price is directly associated with product quality, with the Lithuanians slightly more often viewing price as a cost they seek to minimize. On the other hand, Portuguese respondents tended to slightly disagree with both statements, indicating that for them, the price of foods is neither an indicator of product quality nor a cost they strive to minimize. Answers to these items were not

significantly associated with each other in either the Danish or the Lithuanian sample (Spearman's rho = -.063, p = .507 and Spearman's rho = .120, p = .123, respectively); they were nevertheless significantly positively correlated for the Portuguese sample (Spearman's rho =.300, p < .05). This indicates that the less price conscious Portuguese respondents were also the least inclined to view price as an indicator of the quality of a food product.

Table 2. Means and standard deviations of the answers to items concerning the use of price as a cost and/or quality cue (n_{DK}= 114; n_{LT}= 166; n_{PT} = 56); [a] significantly different at p<.001; [b] significantly different at p<.01.

	Lithuania Mean±Std.	**Denmark** Mean±Std.	**Portugal** Mean±Std.	F-value
The price of foods is a cost I try to minimize	3.6 ± 1.0	3.4 ± 0.9	2.9 ± 1.0 LT,DK,	17.821 [a]
Price is an indicator of food quality	3.5 ±1.0	3.5 ±1.0	3.0 ± 1.0 LT,DK	7.421 [b]

4.4 Cross-cultural importance of different cues and dimensions in the formation of quality expectations

Tables 3 and 4 depict the means and standard deviations of the answers to the items concerning the importance of extrinsic cues, intrinsic cues and expected quality dimensions in regards to bread, cookies and breakfast cereals, and pasta and vodka, respectively. As it can be inferred from the overall results presented in the two tables, Portuguese and Lithuanians consistently gave a higher average importance to all the cues and quality dimensions considered, for all products, than their Danish counterparts. Portuguese respondents, in turn, consistently gave a higher average importance to all the cues and quality dimensions considered, for almost all products - the exception being the expected quality dimensions of vodka -, than the Lithuanian respondents. However, for a fairly large number of products, cues and dimension, the differences between the mean importance scores of these two countries were not statistically significant (F-value, p<.05). Looking at the three main classes of constructs considered in the adapted TFQM for cereal based foods (Figure 1) – extrinsic cues, intrinsic cues and expected quality dimensions – within each the category considered, it can be seen that importance scores were significantly different between the three samples for all variables but the quality dimension *taste* (for the categories bread, breakfast cereals and pasta) and the extrinsic cues *label information* and *due-by-date* (for bread). Finally, results in tables 3 and 4 also show that respondents in all three samples found expected quality dimensions to be much more important than both extrinsic and intrinsic cues across almost all product categories, the exception being vodka for the Danish respondents. Although extrinsic cues were almost always considered to be more important than the intrinsic cue considered – *package* -, across all categories and countries, the differences between the respective mean importance scores were not statistically significant (F-value, p<.05).

Across product categories Danish respondents found the extrinsic cues *label information* and *price*, as well as the expected dimension *taste*, to be the most

important aspects in the evaluation of the cereal-based products' quality. On the other hand, the extrinsic cues *store type, new* and o*ften on sale* were deemed by the Danish respondents to be the least relevant for perceived quality. The importance of expected quality dimensions, moreover, seemed to be dependent on the type of product considered. When considering the purchase of bread, breakfast cereals and pasta, dimensions like *healthy* and *natural* were judged to be fairly relevant. The same did not happen, however, when considering the purchase of vodka, in which case practically no quality dimension except *taste* was deemed to be of any importance. Finally, extrinsic cues like *price* and *brand* also gained salience for the vodka category.

The Lithuanian respondents found the dimension *taste* to be the most relevant factor in pre-purchase quality evaluation. In a manner similar to their Danish counterparts, Lithuanians seemed to consider the importance of other quality dimensions as being category-dependent: for instance, the dimension *ecological* gained relevance only for the categories cookies and vodka, while dimensions like *natural* and *healthy* were deemed to be relevant across all of the categories considered. The high relevance of *Label information* and *price* for consumption decisions of cereal-based products, as well as the low salience of cues like *new* and *often on sale*, were equally acknowledge by the Lithuanian sample. However, Lithuanians found the extrinsic cue *country-of-origin* to be highly relevant for the formation of their quality expectations at the point-of-purchase as well, especially in the case of the categories bread, cookies and vodka. Finally, the importance of brand was higher for the category *label information*.

The relative importance attributed by the Portuguese respondents to the different quality cues and dimensions considered in this study was fairly distinct from that of both the Danish and Lithuanian samples. Although the dimension *taste* and the extrinsic cue *label information* were equally deemed to be relevant, cues like *store type* for bread, *brand* for breakfast cereals, pasta and vodka, *country-of-origin* for vodka, and *price* for cookies, pasta and vodka were frequently assessed by the Portuguese to be very important at the point-of-purchase. *Price*, conversely, was not deemed to be relevant for categories like bread and breakfast cereals. As for expected quality, and in categories like bread, cookies and breakfast cereals, dimensions like *healthy* and *natural* were evaluated as being, on average, nearly as important as tasty in product evaluation at the point-of-purchase. Nevertheless, the type of extrinsic cues considered to be irrelevant by the Portuguese when purchasing most cereal-based foods were similar to those mentioned by their Danish and Lithuanian counterparts - *store type*, *new*, *often on sale*-, although for certain categories cues like *brand* (for

Table 3. Means and standard deviations of the importance of extrinsic cues, intrinsic cues and expected quality dimensions in regards to bread, cookies and breakfast cereals. [Lt] significantly different from the Lithuanian sample; [Dk] significantly different from the Danish sample;

	Bread				Cookies				Breakfast cereals			
	Denmark Mean±Std	**Lithuania** Mean±Std	**Portugal** Mean±Std	F-value	**Denmark** Mean±Std.	**Lithuania** Mean±Std.	**Portugal** Mean±Std.	F-value	**Denmark** Mean±Std.	**Lithuania** Mean±Std.	**Portugal** Mean±Std.	F-value
Extrin. cues												
Store type	2.2 ± 1.0 [Lt,a]	2.9 ± 1.1 [Pt,a]	3.5 ± 1.2 [Dk,a]	35.257 [a]	1.9 ± 1.0 [Lt,a]	2.9 ± 1.1	2.8 ± 0.9 [Dk,a]	29.963 [a]	1.9 ± 1.0 [Lt,a]	2.6 ± 1.1	2.9 ± 1.1 [Dk,a]	18.242 [a]
Brand	2.3 ± 1.0 [Lt,a]	3.0 ± 1.2	3.0± 1.3 [Dk,b]	14.602 [a]	2.3 ± 1.2 [Lt,a]	2.9 ± 1.1 [Pt,a]	3.7 ± 0.7 [Dk,a]	40.419 [a]	2.6 ± 1.2	2.9 ± 1.1 [Pt,a]	4.0 ± 0.8 [Dk,a]	29.351 [a]
CoO info.	2.5 ± 1.1 [Lt,a]	3.9 ± 1.2 [Pt,b]	3.5 ± 1.2 [Dk,a]	60.098 [a]	2.0 ± 1.1 [Lt,a]	3.7 ± 1.1 [Pt,a]	3.0 ± 1.0 [Dk,a]	76.580 [a]	2.2 ± 1.1 [Lt,a]	3.2 ± 1.3	3.0 ± 1.0 [Dk,b]	21.571 [a]
Label info.	3.4 ± 1.1	3.5 ± 1.2	3.5 ± 1.1	0.541	3.1 ± 1.4	3.4 ± 1.1 [Pt,b]	3.9 ± 0.8 [Dk,a]	9.440 [a]	3.3 ± 1.2	3.3 ± 1.2 [Pt,a]	4.0 ± 0.8 [Dk,a]	7.581 [b]
Due-by-date	2.5 ± 1.1	2.5 ± 1.2	2.9 ± 1.3	3.843	2.2 ± 1.2	2.6 ± 1.2 [Pt,a]	3.5 ± 1.0 [Dk,a]	28.209 [a]	2.4 ± 1.2	2.5 ± 1.2 [Pt,a]	3.6 ± 1.0 [Dk,a]	21.766 [a]
New	1.7 ± 0.9 [Lt,a]	2.3 ± 0.9 [Pt,a]	2.8 ± 1.1 [Dk,a]	31.115 [a]	1.8 ± 1.2 [Lt,b]	2.2 ± 1.0 [Pt,a]	3.0 ± 0.8 [Dk,a]	31.859 [a]	1.7 ± 0.9 [Lt,b]	2.2 ± 0.9 [Pt,a]	2.9 ± 0.9 [Dk,a]	29.693 [a]
Price	2.9 ± 1.0 [Lt,c]	3.3 ± 1.1	3.1 ± 1.2	3.719 [c]	2.7 ± 1.2 [Lt,a]	3.5 ± 1.0	3.9 ± 0.8 [Dk,a]	30.692 [a]	3.0 ± 1.0 [Lt,b]	3.5 ± 1.2	3.7 ± 0.8 [Dk,a]	9.751 [a]
Often on sale	1.5 ± 0.7 [Lt,b]	1.8 ± 0.9 [Pt,a]	2.5 ± 1.0 [Dk,a]	36.269 [a]	1.4 ± 0.7 [Lt,b]	1.8 ± 0.9 [Pt,a]	3.2 ± 1.0 [Dk,a]	95.879 [a]	1.5 ± 0.8 [Lt,c]	1.9 ± 0.9 [Pt,a]	3.3 ± 1.0 [Dk,a]	75.496 [a]
Mean	2.4 ± 0.5 [Lt,a]	2.9 ± 0.6 [Pt,c]	3.1 ± 0.6 [Dk,a]	52.254 [a]	2.2 ± 0.8 [Lt,a]	2.9 ± 0.6 [Pt,a]	3.4 ± 0.4 [Dk,a]	81.399 [a]	2.3 ± 0.6 [Lt,a]	2.7 ± 0.7 [Pt,a]	3.4 ± 0.5 [Dk,a]	56.651 [a]
Intrinsic cues												
Package	2.1 ± 1.0 [Lt,a]	2.7 ± 1.1 [Pt,b]	3.0 ± 1.1 [Dk,a]	18.888 [a]	2.2 ± 1.1 [Lt,a]	2.8 ± 1.0 [Pt,a]	3.4 ± 0.8 [Dk,a]	31.793 [a]	2.1 ± 1.0 [Lt,a]	2.7 ± 1.0 [Pt,a]	3.3 ± 0.8 [Dk,a]	26.681 [a]
Quality dim.												
Natural	3.8 ± 0.9 [Lt,a]	4.2 ± 0.8 [Pt,c]	4.5 ± 0.7 [Dk,a]	18.239 [a]	3.1 ± 1.2 [Lt,a]	4.1 ± 0.9	3.9 ± 0.9 [Dk,a]	31.446 [a]	3.7 ± 1.0 [Lt,c]	4.1 ± 1.0	4.0 ± 0.8	4.115 [c]
Ecological	2.9 ± 1.2 [Lt,a]	4.0 ± 1.0 [Pt,c]	3.5± 1.1 [Dk,b]	36.782 [a]	2.6 ± 1.3 [Lt,a]	3.9 ± 0.9 [Pt,b]	3.4± 1.0 [Dk,a]	42.177 [a]	3.0 ± 1.4 [Lt,a]	3.9 ± 1.1 [Pt,c]	3.3± 1.1	13.555 [a]
Healthy	3.9 ± 0.9 [Lt,b]	4.2 ± 0.8	4.5 ± 0.8 [Dk,a]	10.123 [a]	2.6 ± 1.4 [Lt,a]	4.0 ± 0.9 [Pt,c]	4.4 ± 0.8 [Dk,a]	84.030 [a]	3.9 ± 1.1	4.1 ± 1.1	4.5 ± 0.7 [Dk,b]	6.233 [b]
Tastes good	4.0 ± 1.1	4.3 ± 0.8	4.6 ± 0.5	3.584	4.0 ± 1.1 [Lt,c]	4.3 ± 0.7	4.6 ± 0.6 [Dk,b]	11.938 [a]	4.1 ± 0.9	4.1 ± 0.9	4.5 ± 0.6	3.882
Smells good	3.5 ± 0.9 [Lt,b]	3.9 ± 0.9	4.2 ± 0.6 [Dk,a]	13.169 [a]	3.4 ± 1.1 [Lt,c]	3.8 ± 0.9	4.0 ± 0.7 [Dk,a]	12.063 [a]	3.2 ± 1.1	3.3 ± 1.1 [Pt,b]	4.0 ± 0.9 [Dk,a]	12.150 [a]
Mean	3.7 ± 0.7 [Lt,a]	4.1 ± 0.6	4.2 ± 0.5 [Dk,a]	24.497 [a]	3.1 ± 0.9 [Lt,a]	4.0 ± 0.7	4.1 ± 0.5 [Dk,a]	58.516 [a]	3.6 ± 0.8 [Lt,c]	3.9 ± 0.9	4.1 ± 0.6 [Dk,a]	8.308 [a]

[Pt] significantly different from the Portuguese sample; [a] significantly different at p<.001; [b] significantly different at p<.01; [c] significant at p<.05.

Table 4. Means and standard deviations of the importance of extrinsic cues, intrinsic cues and expected quality dimensions in regards to pasta and vodka. [Lt] significantly different from the Lithuanian sample; [Dk] significantly different from the Danish sample; [Pt] significantly different from the Portuguese sample; [a] significantly different at p<.001; [b] significantly different at p<.01; [c] significant at p<.05.

	Pasta				Vodka			
	Denmark Mean±Std	**Lithuania** Mean±Std	**Portugal** Mean±Std	F-value	**Denmark** Mean±Std .	**Lithuania** Mean±Std.	**Portugal** Mean±Std.	F-value
Extrin. cues								
Store type	1.9 ± 0.9 Lt,a	2.8 ± 1.2	2.9 ± 0.8 Dk,a	29.069 a	1.5 ± 0.7 Lt,a	2.9 ± 1.2	3.0 ± 1.2 Dk,a	46.551 a
Brand	2.4 ± 1.1 Lt,a	3.1 ± 1.1 Pt,a	3.7 ± 0.8 Dk,a	35.571 a	2.4 ± 1.3 Lt,a	3.4 ± 1.1 Pt,a	4.5 ± 0.7 Dk,a	41.323 a
CoO info.	2.3 ± 1.2 Lt,a	3.5 ± 1.2	3.3 ± 1.0 Dk,a	35.736 a	1.9 ± 1.1 Lt,a	3.7 ± 1.1	3.9 ± 1.2 Dk,a	72.443 a
Label info.	3.1 ± 1.3	3.3 ± 1.2 Pt,b	3.7 ± 0.9 Dk,a	6.309 b	1.8 ± 1.0 Lt,a	3.1 ± 1.2	3.1 ± 1.1 Dk,a	38.875 a
Due-by-date	2.4 ± 1.1	2.6 ± 1.3 Pt,a	3.6 ± 1.0 Dk,a	24.171 a	1.8 ± 1.0 Lt,b	2.4 ± 1.4	2.8 ± 1.3 Dk,c	8.186 b
New	1.2 ± 0.9 Lt,a	2.2 ± 1.0 Pt,a	2.9 ± 0.8 Dk,a	40.524 a	1.5 ± 0.7 Lt,a	2.4 ± 1.2	2.7 ± 1.2 Dk,b	25.490 a
Price	3.0 ± 1.0 Lt,a	3.6 ± 1.0	3.9 ± 0.9 Dk,a	18.094 a	3.1 ± 1.4	3.5 ± 1.0	3.9 ± 1.1 Dk,c	5.514 c
Often on sale	1.5 ± 0.8 Lt,b	1.9 ± 1.0 Pt,a	3.3 ± 0.8 Dk,a	107.51 a	1.6 ± 0.9 Lt,a	2.1 ± 1.1 Pt,b	3.6 ± 1.2 Dk,a	37.681 a
Mean	2.3 ± 0.6 Lt,a	2.9 ± 0.7 Pt,a	3.4 ± 0.4 Dk,a	79.333 a	2.0 ± 0.6 Lt,a	2.9 ± 0.7 Pt,b	3.4 ± 1.0 Dk,a	78.428 a
Intrinsic cues								
Package type	2.1 ± 1.0 Lt,a	2.8 ± 1.1 Pt,b	3.3 ± 0.9 Dk,a	34.069 a	1.9 ± 1.1 Lt,a	3.1 ± 1.1	3.3 ± 1.0 Dk,a	34.083 a
Quality dim.								
Natural	3.6 ± 1.0 Lt,a	4.0 ± 1.0	4.0± 0.9	8.376 a	2.2 ± 1.2 Lt,a	4.0 ± 1.1	3.4± 1.1 Dk,b	56.546 a
Ecological	2.7 ± 1.3 Lt,a	3.9 ± 1.0 Pt,b	3.4 ± 1.0 Dk,b	35.409 a	1.6 ± 0.9 Lt,a	3.7 ± 1.2 Pt,b	2.7 ± 1.1 Dk,b	82.837 a
Healthy	3.7 ± 1.1 Lt,c	4.0 ± 1.0	4.3 ± 0.6 Dk,a	10.268 a	1.6 ± 0.9 Lt,a	3.5 ± 1.3	2.8 ± 1.3 Dk,a	67.998 a
Tastes good	4.1 ± 0.8	4.2 ± 0.8	4.4 ± 0.7	3.102	3.2 ± 1.4 Lt,a	4.0 ± 1.1 Pt,b	4.6 ± 0.6 Dk,a	21.810 a
Smells good	3.2 ± 1.2	3.3 ± 1.1 Pt,b	3.9 ± 0.9 Dk,a	11.707 a	2.3 ± 1.2 Lt,a	3.7 ± 1.1 Pt,a	4.4 ± 0.6 Dk,a	47.825 a
Mean	3.4 ± 0.8 Lt,a	3.9 ± 0.8	3.9 ± 0.6 Dk,a	15.622 a	2.2 ± 0.9 Lt,a	3.8 ± 1.0	3.6 ± 0.6 Dk,a	82.426 a

bread) and *country-of-origin* (for cookies and breakfast cereals) were also of lesser average importance.

5. Discussion and implications

5.1. Consumption of cereal products and top-of-mind associated country

From the results obtained for the bread category, it is straightforward to conclude that the Danish and Lithuanian respondents consumed mainly rye-based bread, alone or in combination with other types of bakery products, whereas Portuguese respondents more often eat wheat-based bread. However, and in contrast with the Danish respondents, Lithuanian and Portuguese subjects recalled more often the type of bread they consumed by their brand name, or the region-of-origin than by its main cereal component. Given this outcome, marketers would be well-advised to use an indication of region-of-origin more often in the label of their bakery products. This would help distinguish their products both from foreign and domestic competitors. A similar suggestion has been put forward by previous studies [22]. Promotion of local or regional cereal-based foods could also be successful in foreign markets. Given that, to our knowledge, there are no cross-cultural, or even local studies on consumers' preferences for regional cereal products, much could be gained by envisaging this type of research. The present study has shown that respondents in all of the countries considered overwhelmingly associated cereal products (with the exception of vodka and, to a lesser extent, the pasta) with their home countries. This can be understood as a sign of the existence of a strong 'home country biases', consumers' ethnocentrism or patriotism, as this phenomenon has been called in existing literature [23-26]. However, the association of bread to own country can probably be better understood in the light of the respondents' familiarity with fresh bread baked daily in a local shop than by concepts such as consumer ethnocentrism. Results further indicate that almost all respondents in in three countries investigated associated pasta with Italy. This is in agreement with results of previous study, where the country of origin cue is reported as an associative link: Italy – pasta, Russia – vodka [27]. Lithuanian respondents associate vodka mostly with their own country. Consequently, they recalled more often national and regional brands than international ones.

5.2. Use of price as cost and/or quality cue in the formation of quality expectations

The results obtained regarding the use of price cues indicate that both Danish and Lithuanian respondents agree to a certain extent with the view that price is directly associated with both cost and quality, with the Lithuanians slightly more often viewing price as a cost they seek to minimize. Simultaneously, *price,* although not to the same extent as *country-of-origin*, was viewed by Lithuanians as a highly important cue in the evaluation of cereal-based products. Although internally consistent, these results contradict those of a previous study, which indicate that, for purchases of low involvement products, where value for money matters more than image or quality, price is more influential than country-of-origin in consumers' purchase decisions [28]. On the other hand, Portuguese respondents tended to somewhat disagree with both price-related statements presented in the

survey, indicating that for them, the price of foods in neither an indicator of product quality nor a cost they strive to minimize. This was confirmed by the relatively low importance attributed by these respondents to price as a quality cue for most of the categories considered. This indifference to price does not come as a surprise since food culture is stronger in Portugal than in the other two countries investigated. The existence of a myriad of small farms, traditionally low food prices and high food quality which often is taken for granted, altogether explain why Portuguese respondents do not actually give a second thought to food quality. Lithuanian and Danish eating cultures, on the other hand, have never been as strong or rich as that of Portugal. This may explain why respondents of the former countries tended to consider price as an expense they try to minimize. Previous research has indicated that consumers sometimes believe "they should get exactly what they pay for", and consequently use price as an indicator of product quality [29]. These findings lead us to conclude that whether price is used as a quality cue, a cost cue or both (or none) seems to be culturally dependent. It would thus be interesting to investigate this issue further in future studies regarding food quality perception.

5.3. Cross-cultural importance of different cues and dimensions in the formation of quality expectations

Since consumers use country-of-origin as a cue to evaluate product quality [30-34], the above mentioned discussion on region of origin/country of origin is relevant. However, COO is only one of many product cues consumers have at their disposal to evaluate food quality [34]. When asked about cues and quality dimensions, Portuguese and Lithuanian respondents gave a higher average importance to all the cues and quality dimensions considered, across all product categories, than their Danish counterparts. Such personal relevance of foods may be perceived as a sign of a high involvement with foods. Moreover, our results indicate that the quality attribute *taste* was perceived as equally highly important for all respondents of three countries investigated. This is in line with research findings of reporting that taste is extremely important factor in food choice [35-40], namely for cereal-based products like bread as well [41]. From a quality perceptions perspective, our results are in line with previous research indicating that consumers who are more involved with foods are equally more sensitive to sensory and hedonic attributes [42, 43]. Finally, previous studies have showed that the packaging of a food or beverage may provide a cue that influences taste evaluations [44]. This finding could not be replicated in the context of our study seeing that package – the single intrinsic cue considered -, was mostly deemed as fairly irrelevant by respondents in all samples. This discrepancy is understandable seeing the respondents' high familiarity with the product categories considered in the study.

For all three countries extrinsic cues were always more important than intrinsic ones, which contradicts previous findings indicating that intrinsic cues are generally stronger determinants of perceived quality than their extrinsic counterparts [45]. Further studies also suggest that the use of extrinsic cues can be more common among purchases of low-involvement food products, since "the cost of searching for intrinsic cues to aid consumers in product evaluation far exceeds the benefits" [46]. In the case of the current study, the only purchase that might be considered as a high-involvement one is that of vodka. Accordingly, for this case,

our results show that both the quality dimensions and the extrinsic and intrinsic cues considered were deemed to be equally relevant in the formation of expected quality.

Looking at each of the countries studied individually, it can be seen that the Danes found price and label information to be important. This is in accordance with the tendency exhibited by their answers to the survey's question on price as a cost to be minimised. As discussed in sub-section 5.2, Danish respondents did not consider both cues and quality dimensions as a whole to be as important as their Danish and Lithuanian counterparts. This could be taken as a sign of a relatively lower involvement with food purchase and consumption. A previous study has also indicated that price seems to be more often used as a quality cue among poorly motivated consumers [47]. The results obtained for the Danish sample also reveal that importance they confer to different quality dimensions depended on category of products in question. For example, it was important for this sample that bread, cereals and pasta were healthy and natural products, but not vodka or cookies. Danes also found label information to be very relevant when considering quality of cereal-based products. Another related study has investigated the effect of health-related information on the liking of bread, and found that liking was enhanced in the presence of label information about health-related attributes [48].

In many ways, the Lithuanian sample yield similar results to that of its Danish counterpart. Nevertheless, Lithuanians found country-of-origin a very important cue, especially in the case of bread, cookies and vodka. They also mentioned brand as a very important cue for vodka. This is in line with the results from the survey's open-ended questions about vodka, to which most of the Lithuanian respondents replied resorting to brand names.

The quality cues and dimensions Portuguese found relevant were fairly different from those of the Danish and Lithuanian samples. Once more, and to a great extent that for any of the other countries investigated, the perceived relevance of the different cues and quality dimensions was category-dependent. This points out to the need of further research in the area of the cross-cultural (and inter-category) relevance of the different cues and dimensions usually considered in conceptual models of food quality perception.

5.4. Limitations and future research

It should be noted that our initial objective of obtaining fairly large samples, which would be to some extent representative of the respective national populations of the three countries under study, was only partially achieved. The next aim is therefore to collect more data in these countries, a task that will allow us to infer stronger results regarding quality perception of cereal-based foods as it is perceived by Lithuanians, Danish and Portuguese nationals. Given the opportunity, it would also be interesting to test the cross-cultural validity of our survey instrument in other EU countries. The outcome of the present study hopefully highlights the needs for more cross-cultural development and testing of behavioural models of food purchase and consumption.

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