Identifying important package features of milk desserts using free listing and word association

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ABSTRACT

Identifying the package and label features that are most relevant for consumer might provide useful information for designing a food package that closely matches consumer needs and expectations. In the present work two groups of 100 milk dessert consumers were asked to elicit package and label features of milk desserts using word association and free listing. Both methodologies were useful, efficient and quick methods to determine package and label features most likely to influence consumer perception of milk desserts. Although some differences were found between them, results related to the design of milk dessert packages were similar and suggested that brand, package shape, colour, and the design of the label might be the most relevant features that should be taken into account during package design of this food product. Cluster analysis of participants enabled the identification of groups of consumers that might be driven by different package features when making their purchase decisions of milk desserts.

1. Introduction

Food choice is a complex process which involves many different factors, including sensory and non-sensory characteristics. The sensory characteristics of a product are not enough to meet consumer requirements in the context of today's highly competitive and fast moving markets (Enneking, Neumann, & Henneberg, 2007). There are several non-sensory factors, such as packaging, brand and price, which play a very important role in determining consumer purchase decisions (Jaeger, 2006). Several studies have shown that packaging and labelling are important factors that affect consumer perception and purchase intention of food products (Abadio-Finco, Deliza, Rosenthal, & Silva, 2010; Acebrón & Dopico, 2000; Bower, Saadat, & Whitten, 2003; Carneiro et al., 2005; Deliza & MacFie, 1996; Deliza, MacFie, & Hedderley, 2003; Enneking et al., 2007; Jaeger, 2006; Rozin & Tuorila, 1993).

Food package is the container that holds, protects, preserves and identifies the product, and also facilitates its handling, storage and commercialization (Rodríguez Tarango, 2003). Packaging also plays a major role in attracting consumer attention and influencing consumer purchase decisions. In the current self-service economy,

packaging provides food companies the last chance to persuade consumers to buy the product before brand selection (McDaniel & Baker, 1977). Therefore, all packaging elements have to be combined to attract the consumer when purchasing the product (Ampuero & Vila, 2006; McNeal & Ji, 2003). Apart from influencing consumer purchase decision, food package may also create expectations in the consumer (Deliza et al., 2003; Rodríguez Tarango, 2003). Thus, manufacturers should use food package to catch consumer attention but also to generate appropriate expectations regarding the product.

On the other hand, labelling is part of a typical package and also plays an important role in capturing the attention of consumers. Usually, a label carries the brand name, the name and address of the producer or distributor, information about the product's characteristics, ingredients and serving size, pictures, information related to recommended uses, cooking instructions, instructions for proper disposal and shelf-life date (Harcar & Karakaya, 2005). Labelling could have a major influence on food acceptance (Carneiro et al., 2005; Deliza & MacFie, 1996; Jaeger, 2006; Rozin & Tuorila, 1993). In the last decade consumers have increased their demand for more detailed, accurate and accessible information on food labels (Deliza, MacFie, & Hedderley, 1999). Rozin (1990) showed that labels can influence preferences even if subjects know their information is false. Moreover, information in food labels has also changed in Uruguay due to changes in regulation since

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nutritional labelling became compulsory in 2006 (Grupo Mercado Común, 2003).

In this context, it is important to identify which are the package features that are relevant to consumers and which is the information they expect to find in a label. The identification of these features might offer the possibility of designing a food package that closely matches consumer needs and expectations (Deliza et al., 1999) contributing to consumer product satisfaction.

The initial step in package design is gathering a first insight about the package features that are more likely to affect consumers' perception, preference and satisfaction of food packages. There are several qualitative methodologies that could be used for this purpose (van Kleef, van Trijp, & Luning, 2005). Deliza et al. (1999) used Focus Group and Repertory grid to identify package features important to consumers' perception of passion fruit juices. Although both methodologies yielded interesting and useful information, they could have some drawbacks. Despite the fact that focus group is one of the most extensively used qualitative technique (van Kleef et al., 2005), it has some limitations such as the fact that it requires a trained and experienced moderator; the cost and time required for performing the sessions, the difficulty for working with large consumer samples, and for analyzing the elicited information (Casey & Krueger, 1994). Regarding repertory grid, results are dependent on the stimulus selected for the study. Moreover, according to Steenkamp and van Trijp (1997) this technique yields fewer attributes than other less structured techniques, such as free elicitation.

Word association and free listing are less structured qualitative techniques that are being increasingly used in consumer science to investigate consumers' perception of food products (Ares, Giménez, & Gámbaro, 2008; Guerrero et al., 2010; Hough & Ferraris, 2010; Roininen, Arvola, & Lähteenmäki, 2006). These methodologies could also be suitable for identifying what are the most relevant package features for consumers with the advantages that respondents' associations might be more effective and less subject to fewer restraints than those elicited by other qualitative techniques, since no highly trained interviewer or real product stimuli are necessary (Szalay & Deese, 1978). In the present work the applicability of word association and free listing for this purpose was evaluated.

Word association is a qualitative methodology commonly used in psychology and sociology (Doise, Clémence, & Lorenzi-Cioldi, 1993; Schmitt, 1998). This methodology is based on the assumption that giving a stimulus to a respondent and asking him (her) to freely associate what ideas come to his (her) mind could give relatively unrestricted access to mental representations of the stimulus. When dealing with food products, the associations that first come to the respondents' mind may be the most relevant for consumers' decisions related to product purchase (Roininen et al., 2006). The ideas expressed within a word association task are spontaneous productions subject to fewer constraints than that typically imposed in interviews or closed questionnaires (Wagner, Valencia, & Elejabarrieta, 1996). For these reasons, word association has been reported to be a quick, simple and useful qualitative methodology for exploring consumer perception of food products (Ares et al., 2008; Roininen et al., 2006).

On the other hand, Free Listing is a simple qualitative technique widely used in anthropology (Rusell Bernard, 2005). It consists of asking participants to "list all the X they know about", where X could be anything from fruits to brands of TVs or animals (Rusell Bernard, 2005). The object of this methodology is to get participants to list as many items as they can in a certain domain. According to several authors, the items with the higher number of mentions are the ones most relevant for consumers (Henley, 1969). Hough and Ferraris (2008, 2010) introduced this methodology to get an insight of consumer perception of fruits. Although the

original application of this methodology was to elicit terms within a certain category, these authors proposed to use it in other scenarios such as elicitation of the uses/occasions consumers consider appropriate for a food product or the things consumers feel when eating a certain product.

The aims of the present work were to: (a) identify the most important package features that affect consumer perception of milk desserts using word association and free listing, and (b) compare results from both methodologies.

2. Materials and methods

2.1. Stimuli

The base product of the study was a milk dessert. This product is widely consumed in Uruguay by several groups of consumers, including children and elderly people. The type of milk dessert considered in the present study are those formulated with milk, sugar, flavourings and thickeners, and commercialized under refrigeration. Besides, there is increasing marketing activity regarding milk desserts, as most dairy companies have launched new low-fat and low-calorie desserts.

2.2. Participants

The study was conducted in the city of Montevideo (Uruguay) using a convenience sample. Two hundred people participated in the study; 38% of which were males and 62% females. Participants ranged in age from 18 to 71 years old (mean 35.1 years old, standard deviation 13.0 years old). Participants were randomly recruited at shopping areas, universities campus and public places. Participants were recruited based on milk desserts consumption frequency, and interest to participate. Consumers were explained which types of milk desserts were considered by mentioning the most popular products available in the Uruguayan marketplace at the time the study was performed. Only those consumers showing a consumption frequency of milk desserts higher than once a week were selected. Recruited participants were randomly divided into two subgroups, which yielded two homogenous groups of one hundred people. Each group was asked to complete either a free listing or a word association task. As expected, there were no significant differences in the gender, age and milk dessert consumption frequency distributions between the two consumer groups, as shown in Table 1. Therefore, differences in the results of both groups might be due to differences between the methodologies, and not due to heterogeneity of the groups.

2.3. Methodology

Consumers had no time limit to complete the task and needed between 2 and 10 min for both methodologies.

2.3.1. Word association task

Participants were asked to complete a word association task considering as stimuli the package and label of a milk dessert. They were given a sheet of paper with written instructions where they wrote down the elicited items.

Instructions given to participants were the following: 'Imagine el envase y la etiqueta de un postre lácteo. Por favor, escriba todas las palabras, descripciones, asociaciones, pensamientos o sentimientos que vienen a su mente'; i.e. 'Imagine the package and label of a milk dessert. Please, write down all the words, descriptions, associations, thoughts or feelings that come to your mind'.

Table 1
Demographic data of participants in the word association and free listing task.

	Group	
	Word association (n = 100)	Free listing (n = 100)
Mean age[ns] (years)	34.1	36.0
Age distribution[ns]		
18 to 34 years (%)	59	62
35 years and more (%)	41	38
Gender distribution[ns]		
Men (%)	41	35
Women (%)	59	65
Milk desserts consumption frequency distribution[ns]		
Once a week (%)	52	57
3 to 4 times a week (%)	35	26
More than 4 times a week (%)	13	17

ns - Indicates no significant difference ($p > 0.05$) according to t test for Mean age, and χ^2 test for age, gender and milk desserts consumption frequency distributions.

2.3.2. Free listing

Considering that word association elicited terms without providing consumers of a specific scenario, free listing was applied to elicit which package features were relevant for consumers when thinking of buying a milk dessert. Hough and Ferraris (2010) proposed the use of free listing to study consumer responses to specific scenarios, such as elicitation of appropriate uses/occasions for a food product.

Participants were asked to list all the features of the package and label of a milk dessert they consider at purchase stage. Similarly to Word Association, they were given a sheet of paper with written instructions, where they wrote down the elicited items. Instructions given to participants were the following: 'Por favor, haga una lista de todas las cosas del envase y la etiqueta de un postre lácteo que Ud. tiene en cuenta en el momento de decidir la compra'; i.e. 'Please list all the things of a milk dessert package and label that you take into account when deciding to buy it'.

2.4. Data analysis

Firstly the number of terms elicited by each participant was counted. The average number of elicited terms was determined for each methodology.

Then, the elicited associations were qualitatively analyzed for each technique. A search for recurrent terms was performed. Terms with similar meaning were grouped in the same category. This classification was performed independently by three Spanish-speaking researchers considering personal interpretation of the meaning of the words, and synonymy as determined by a Spanish dictionary. After individually evaluating the data, a meeting of the researchers was undertaken to check the agreement between their classifications. The final categories and their names were consensually determined by researchers. This triangulation technique has been used by other authors dealing with qualitative techniques (Guerrero et al., 2010; Modell, 2005; Wadsworth, 2000).

Categories mentioned by more than 10% of the participants were considered, and their frequencies were determined by counting the number of participants that used those words. This percentage was determined considering that it corresponded to 10 consumers because 100 people took part in the study. Hough and Ferraris (2010) considered terms listed by more than 10% and 25% when performing cluster analysis or multidimensional scaling on data from free listing. This procedure was adopted for each methodology. Then, the rank in which each term was elicited by each consumer was determined.

Cluster analysis of categories and consumers was carried out to evaluate if participants grouped categories into clusters (Hough & Ferraris, 2010) and to identify groups of consumers with similar associations when thinking of a milk dessert package. Hierarchical cluster analysis was performed on the participants × categories matrix. Manhattan distances and Ward's aggregation method were considered. Chi-square was calculated for evaluating differences between the identified consumer groups. All data analyses were performed using GenStat for Windows Discovery Edition 2 (VSN International Ltd., Hempstead, UK).

3. Results and discussion

3.1. Word association

In the word association task participants elicited an average of 5.4 terms. The minimum number of terms elicited was 2 and the maximum 10. The relatively large number of words suggests that consumers had a clear representation of the stimulus (Guerrero et al., 2010).

The number of association categories mentioned by more than 10% of the participants was 20. Table 2 shows the final association categories and some examples of individual words elicited by participants. Participants' associations when thinking of the package and label of a milk dessert were mainly related to package and label features, as expected. When thinking of a milk dessert package and its label consumers elicited terms related to the design of the package, such as colour, shape, packaging material and lid, all of them typically used in milk dessert packages of commercial products. This suggests that consumers' memory played a role in this task.

Moreover, consumers also elicited terms related to the design of the label; which suggests that this feature might be important in catching their attention when deciding their purchase. Furthermore, the information included in the label (e.g. nutritional

Table 2
Association categories, examples of participants' elicited words, frequency and average order in which they were mentioned in the Word association task, when thinking of the package and the label of a milk dessert.

Category	Examples	Frequency (%)	Average order
Colour	Yellow, attractive colours, light colours	59	2.7
Shape	Squared, rounded, ovaled	46	2.4
Flavour	Vanilla, chocolate, dulce de leche	34	3.1
Net content	Small, adequate serving size, content, net content	34	2.5
Brand	Brand, Conaprole, Ser, Danette, Viva	30	3.1
Nutritional information	Nutritional table, nutritional information, nutrient content	30	4.4
Delicious	Delicious, tasty, yummy	30	2.7
Creamy	Creamy, creaminess	30	3.8
Label design	Colour of the label, font size, text written on the label	30	4.6
Milk dessert picture	Milk dessert picture/drawing	26	3.9
Lid	Lid, aluminium foil, easy to open	20	3.7
Sweet	Sweet	18	3.4
Shelf-life date	Shelf life, shelf-life date	18	4.9
Packaging material	Plastic, hard, resistant	18	2.8
Low-calorie	Low-calorie, light	16	5.6
Soft	Soft	15	2.4
Healthy	Healthy, nutritive	15	3.7
Ingredients	List of ingredients, ingredients	15	4.6
Thick	Thick, viscous	13	5.9
Attractive	Attractive/interesting package	13	3.6

information, brand, ingredients, and shelf-life date) was also elicited by consumers in the word association task.

There were also some associations with the sensory and hedonic characteristics of the milk desserts. This could be attributed to the fact that consumers also thought of the dessert's flavour and texture when completing the task. However, this could also be explained considering that packaging plays an important role in generating sensory expectations in the consumer. In a study performed by Deliza et al. (1999) consumers elicited sensory terms when evaluating passion fruit juice packages. These authors reported that packaging affected consumers' sensory expectations of the juices. Therefore, when thinking of a food package consumers might think of the sensory characteristics of the product it contains. The elicited sensory characteristics might be the most important drivers of liking of this product, e.g. creamy, thick, soft and sweet. These attributes have been reported to be drivers of liking for this type of product in previous studies (Ares, Giménez, Barreiro, & Gámbaro, 2010).

Frequency of elicitation has been related to the importance of a concept in consumers' mind (Guerrero, Colomer, Guàrdia, Xicola, & Clotet, 2000). Thus, the frequency in which each term was mentioned may reflect its importance in consumers' perception of milk dessert packages. As shown in Table 2, the most frequent terms were the colour and shape of the package, mentioned by 59% and 46% of the participants, respectively. The importance of these package features has been reported by other authors (Ampuero & Vila, 2006; Deliza et al., 1999, 2003; Hutchings, 2003; Marshall, Sutart, & Bell, 2006). Other frequently mentioned terms were the flavour of the dessert and the brand. Consumers might have elicited the flavour and brand of the products they usually consume. Brand has been reported to be one of the most important information on the label of food products (Deliza & MacFie, 1996; Makens, 1965; Stokes, 1985). The design of the label, serving size, and nutritional information were also important for consumers, being mentioned by 30% of the sample.

The design of the label and the presence of a picture or drawing of the milk dessert inside the package also appeared as important features. According to Cardello (1995) and Deliza et al. (1999) illustrations and symbols provide important information to consumers about what to expect of the product inside the package, and might be important in influencing consumer purchase intention. Therefore, consumers seemed to expect a picture in the label in order to know what is inside the package before purchasing the product.

Creaminess was the sensory term with the highest frequency of mentions; indicating the importance of this sensory characteristic in consumers' perception of milk desserts.

The order in which a term was mentioned could also provide information about its relative importance. Items with the lowest average order were colour, shape, net content, delicious and soft, as shown in Table 2. Therefore, in this case, the frequency and order in which each term was mentioned did not provide the same information, despite the fact that they were significantly correlated ($p = 0.03$). For example, although colour was mentioned by 59% of participants, and packaging material by only 18%, both terms showed the same average order score. Besides, whereas the term soft was mentioned by only 15% of the consumers, it showed one of the lowest average orders.

Cluster analysis revealed two groups of consumers with similar associations: Cluster 1 composed of 68 participants and Cluster 2 with 32 individuals. As shown in Table 3, the clusters significantly differed in their associations ($\chi^2 = 244.5$, $p < 0.001$). The frequency in which most of the elicited terms were mentioned by each cluster was different, suggesting that these groups of consumers might give different relative importance to the elicited package features. Participants in Cluster 2 associated milk packages with sensory and hedonic characteristics with a higher frequency than participants

Table 3
Frequency of mention and average order for the elicited terms for the two clusters identified in the word association task.

Category	Frequency		Average order	
	Cluster 1 ($n = 32$) (%)	Cluster 2 ($n = 68$) (%)	Cluster 1 ($n = 32$)	Cluster 2 ($n = 68$)
Colour	63	57	2.9	1.9
Shape	75	32	4.9	3.2
Flavour	47	28	3.6	2.8
Net content	38	32	2.3	2.7
Brand	59	17	3.5	2.4
Nutritional information	69	12	4.9	3.2
Delicious	9	39	3.5	2.7
Creamy	16	36	7.7	3.1
Label design	31	28	5.7	4.0
Milk dessert picture	44	19	4.6	3.1
Lid	38	12	5.9	3.4
Sweet	6	24	9.0	2.8
Shelf-life date	53	1	5.1	3.0
Packaging material	31	12	2.3	3.4
Low-calorie	22	15	6.0	5.0
Soft	0	22	–	2.4
Healthy	0	22	–	3.7
Ingredients	38	4	5.0	3.0
Thick	6	18	9.0	5.4
Attractive	25	7	3.6	3.7

in Cluster 1. The most relevant package features for consumers in Cluster 2 seemed to be colour, shape, net content, and the design of the label. On the other hand, participants in Cluster 1 mainly elicited terms related to the packages, such as package design (e.g. shape, colour, milk dessert picture) but also related to the written information on the label (e.g. nutritional information, shelf-life date, and brand).

The clusters also differed in the average order in which the terms were mentioned. Although there were some differences in the order of mention that were in agreement with their frequency of mention; there were some items in which this relationship was not found. For example, although nutritional information was mentioned by only 12% of consumers in Cluster 2 its average order of mention was 3.2. Meanwhile, 69% of the participants in Cluster 1 mentioned this term but showed a higher average order, 4.9. This suggests that frequency and order of mention could provide different information about consumers' memory and cognitive structures related to milk dessert packages.

Cluster analysis was useful for providing information about the elicited terms' relationship in consumers' mind. Items mentioned close to each other might have a stronger relationship in consumer mind than items mentioned apart from each other (Hough & Ferraris, 2010). As shown in Fig. 1, the elicited terms were clustered in two main groups, which reflected the above mentioned differences between the two identified consumers' segments. One of the groups was related to sensory and nutritional characteristics of milk desserts (Cluster 2). On the other hand, the other group of terms was related to package (such as shape and colour) and label features (such as brand, nutritional information and information about the flavour of the dessert); mainly elicited by consumers in Cluster 1. Therefore, items elicited in the word association task could be grouped in those related to package and label features, and those related to sensory expectations generated when freely thinking about a milk dessert package.

3.2. Free listing

Participants listed an average of 4.9 items in the free listing task. The minimum number of items listed was 2 whereas the maximum was 9. The average minimum and maximum number of elicited terms was similar to those of the word association task.
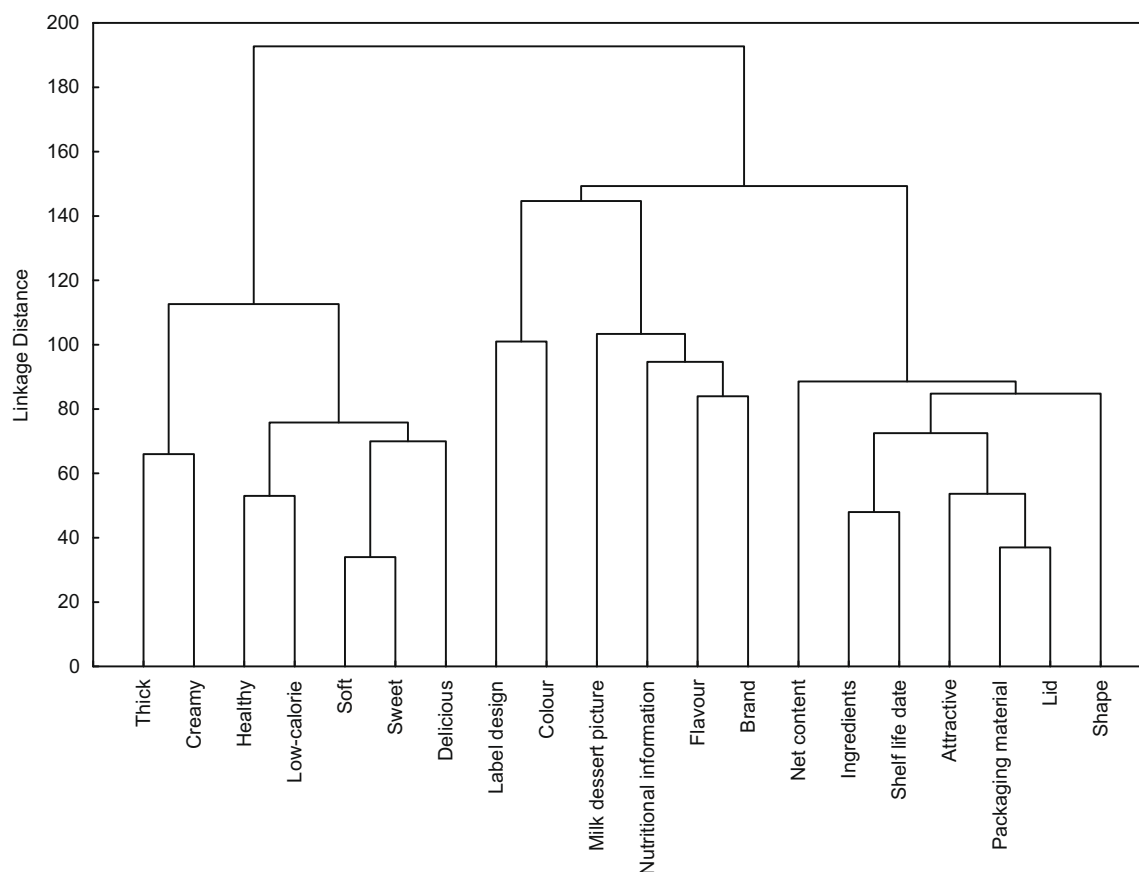
Fig. 1. Cluster analysis of the categories elicited in the word association task.

Seventeen items were listed by more than 10% of the participants. As shown in Table 4, these items included brand, package features, information presented on the label and package integrity. This is in agreement with Carneiro et al. (2005) who reported that shelf-life date; price and brand were the three most observed characteristics by consumers on the label of soybean oil.

Except for the flavour of the dessert, which is usually part of the information presented on the label, there was no mention of any other sensory characteristic of the desserts. This could be explained considering that free listing was performed taking into account pur-chase stage. The terms elicited using this technique might be re-lated to those consumers closely examine at purchase stage because they are important when deciding to buy a milk dessert.

The most frequently elicited item was shelf-life date, mentioned by 60% of participants, suggesting the importance of this informa-tion when consumers purchase a food product. This is in agree-ment with Giménez, Ares, and Gámbaro (2008) and Carneiro et al. (2005) who reported that most of consumers usually look at shelf-life date when purchasing a food product.

The other frequent items were brand and the flavour of the des-sert, as shown in Table 3.

According to results from the free listing task, apart from compulsory information, the package features more relevant for consumers might be package shape, its colour and the design of the label, as well as a picture of a milk dessert. These results are similar to those from the word association task. Despite dif-ferent scenarios were considered in the word association and free listing task, the same package features relevant for consum-ers were identified by both methodologies. Regarding the design of milk packages, information provided by both methodologies were similar implying that terms freely elicited in the word association task might be relevant for consumers at purchase stage. Free listing provided more information about consumers' purchase decisions. According to this methodology shelf-life date, brand, flavour, net content and nutritional information seemed to be the most important information on the label of a milk dessert.

Another relevant attribute for consumers was package integrity and cleanness, suggesting that food manufacturers and retailers should take care of these aspects that seem relevant for consumers at purchase stage.

Table 4
Categories mentioned in the free listing task, frequency and average order in which they were listed.

Category	Frequency (%)	Average order
Shelf-life date	60	3.3
Brand	49	2.6
Flavour	41	2.6
Net content	40	3.4
Nutritional information	36	4.0
Package colour	31	3.3
Package shape	31	2.8
Package integrity	29	2.7
Picture of a milk dessert on the label	26	5.1
Design of the label	26	5.1
Ingredients	24	3.3
Low-calorie	19	3.2
0% fat	16	3.9
Price	16	4.5
Attractiveness	14	6.1
Packaging material	11	2.5
Practical package	10	3.1

Table 5
Frequency of mention and average order for the elicited terms for the two clusters identified in the free listing task.

Category	Frequency		Average order	
	Cluster 1 (n = 67) (%)	Cluster 2 (n = 33) (%)	Cluster 1 (n = 67)	Cluster 2 (n = 33)
Shelf-life date	97	48	3.1	3.6
Brand	84	30	2.7	2.1
Flavour	75	22	2.4	3.6
Net content	50	52	3.5	3.3
Nutritional information	53	35	3.9	4.1
Package colour	16	74	3.4	3.2
Package shape	22	65	2.4	2.9
Package integrity	31	43	2.5	2.9
Picture of a milk dessert	9	65	2.7	5.5
Design of the label	6	70	2.5	5.4
Ingredients	28	35	2.8	3.9
Low-calorie	38	4	3.1	5.0
0% fat	28	9	4.0	3.5
Price	31	4	4.4	6.0
Attractiveness	16	22	4.8	7.4
Packaging material	9	22	2.0	2.8
Practical package	9	17	1.7	4.3

It is important to notice that in the word association task consumers did not frequently mention some of the terms they seem to take into account when deciding to buy a milk dessert (Table 2). However, most of these terms were related to compulsory information of food packages and therefore might not be relevant for the package design.

The order in which each term was mentioned could also provide information about the relative importance of each term for consumers (Henley, 1969). Packaging material, brand, flavour, package shape and integrity showed the lowest average order scores. However, except from brand and flavour, none of these categories were among the most mentioned. Therefore, the frequency and order in which each term was mentioned were not significantly correlated to each other (p = 0.21) and did not provide the same information. This result is not in agreement with Hough and Ferraris (2010) and Picard, Dacremont, Valentin, and Giboreau (2003) who reported a relationship between the frequency and order in which an item was listed for fruits and fabric sensations, respectively.

Cluster analysis was carried out to identify groups of consumers which listed similar attributes. Two groups of consumers were identified: Cluster 1 composed of 67 participants and Cluster 2 with 33 individuals. The clusters differed in frequency in which each category was listed (χ^2 = 81.9, p < 0.001). This suggests that these groups of consumers might pay attention to different attributes when deciding to purchase a milk dessert package. As shown in Table 5, participants in Cluster 1 mainly mentioned brand, flavour and shelf-life date as the main features they take into account when purchasing a milk dessert. Apart from these features, participants in Cluster 1 also mentioned nutritional information and price as the main determinants of their purchase decisions regarding milk desserts. On the other hand, consumers in Cluster 2 mentioned features related to the design of the package and the label, such as package shape and colour, as the main characteristics they looked for when buying milk desserts, suggesting that this cluster was mainly driven by the attractiveness of the package when making purchase decisions. On the contrary, apart from flavour and
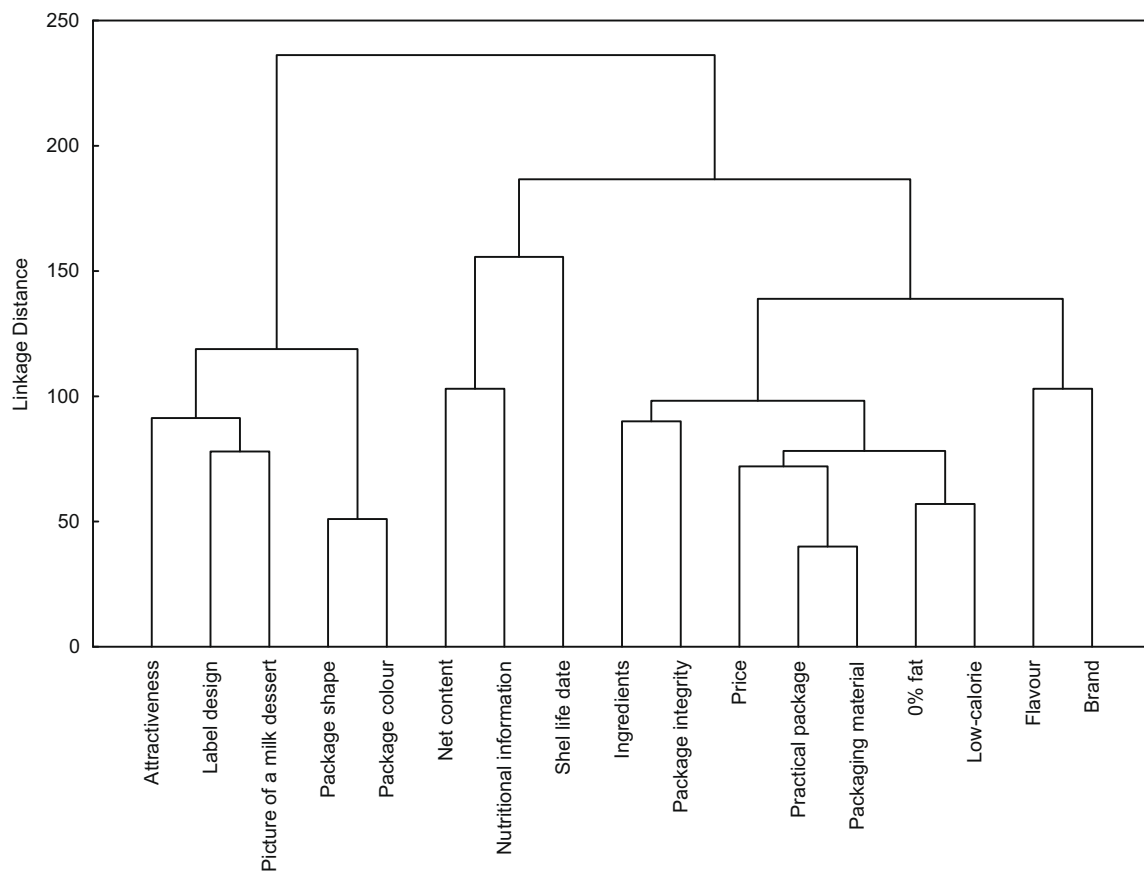

Fig. 2. Cluster analysis of the categories listed in the free listing task.

shelf-life date, consumers in Cluster 1 seem to mainly take into account brand when buying milk desserts. This information might be important for food companies as they could use package features to attract a consumer segment that might be easily driven by food packaging.

According to both methodologies, there seems to be a group of consumers that was more influenced by packaging, while another consumer segment has given a higher importance to brand and compulsory information, when making their purchase decisions regarding milk desserts.

As shown in Fig. 2, the elicited terms were clustered in two main groups, one related to the design of the package; and the other to the information on the label, and other characteristics such as brand, package integrity or flavour of the dessert. This clustering reflects the abovementioned differences between the two identified consumer segments.

4. Conclusions

Free listing and word association were useful, efficient and quick methods to determine the most salient package and label features in consumer minds that might influence their perception of milk desserts. These methodologies could consist on simple, interesting and powerful alternatives to other qualitative techniques, such as focus group, to elicit consumers' attributes relevant for their perception of a certain food product or concept.

Word association provided more unconscious associations that free listing due to the fact that consumers were asked to freely think about a milk dessert package and not in the features they consider when deciding to buy a milk dessert. However, despite different scenarios were considered, results related to the design of a milk dessert package were similar. The package features more relevant for consumers might be package shape and colour, as well as the design of the label. From the compulsory information, shelf-life date, brand and nutritional information might be the most important data that consumers expect to find in a milk dessert label. These results could help marketing to design more attractive packages that create appropriate expectations regarding the product. Further research is necessary to investigate how the elicited package features affect consumer purchase intention, and the expectations generated by the packages, for example by using conjoint analysis. It would also be interesting to determine if the most mentioned features are really the most important attributes influencing consumer purchase decisions.

For both methodologies the frequency and average order in which each item was mentioned provided different information. Some terms were mentioned by just a small proportion of the consumers but got a low average order score. Therefore, in the present study it seemed that frequency of mention provided more information regarding the relevance of each term. However, further research is necessary to understand which information is provided by each of these parameters, and to improve the analysis of the elicited data.

Cluster analysis of participants enabled the identification of groups of consumers that might give different importance to the elicited terms and therefore were driven by different package or label characteristics. Considering these results, it would be interesting to investigate how each of these clusters behaves when evaluating real products or package attributes. This information might allow food companies to design packages that address the needs or interests of different consumer segments.

References

Abadio-Finco, F., Deliza, R., Rosenthal, A., & Silva, C. H. O. (2010). The effect of extrinsic product attributes of pineapple juice on consumer intention to purchase. *Journal of International Food Agribusiness & Marketing, 22*, 125–142.

Acebrón, L. B., & Dopico, D. C. (2000). The importance of intrinsic and extrinsic cues to expected and experienced quality: An empirical application for beef. *Food Quality and Preference, 11*, 229–238.

Ampuero, O., & Vila, N. (2006). Consumer perceptions of product packaging. *Journal of Consumer Marketing, 23*, 100–112.

Ares, G., Giménez, A., & Gámbaro, A. (2008). Understanding consumers' perception of conventional and functional yogurts using word association and hard laddering. *Food Quality and Preference, 19*, 636–643.

Ares, G., Giménez, A., Barreiro, C., & Gámbaro, A. (2010). Use of an open-ended question to identify drivers of liking of milk desserts. Comparison with preference mapping techniques. *Food Quality and Preference, 21*, 286–294.

Bower, J. A., Saadat, M. A., & Whitten, C. (2003). Effect of liking, information and consumer characteristics on purchase intention and willingness to pay more for a fat spread with a proven health benefit. *Food Quality and Preference, 14*, 65–74.

Cardello, A. V. (1995). Sensory evaluation and consumers food choices. *Cereal Foods World, 40*(11), 876–878.

Carneiro, J. D. S., Minim, V. P. R., Deliza, R., Silva, C. H. O., Carneiro, J. C. S., & Leão, F. P. (2005). Labelling effects on consumer intention to purchase for soybean oil. *Food Quality and Preference, 16*, 275–282.

Casey, M. A., & Krueger, R. A. (1994). Focus group interviewing. In H. J. H. MacFie & D. M. H. Thomson (Eds.), *Measurement of food preferences* (pp. 77–96). London: Blackie Academic & Professional.

Deliza, R., & MacFie, H. J. H. (1996). The generation of sensory expectation by external cues and its effect on sensory perception and hedonic ratings: A review. *Journal of Sensory Studies, 11*, 103–128.

Deliza, R., MacFie, H., & Hedderley, D. (1999). An investigation using the repertory grid and focus group methods of the package features affecting consumer perception of fruit juice. *Brazilian Journal of Food Technology, 2*, 63–71.

Deliza, R., MacFie, H., & Hedderley, D. (2003). Use of computer-generated images and conjoint analysis to investigate sensory expectations. *Journal of Sensory Studies, 18*, 465–486.

Doise, W., Clémence, A., & Lorenzi-Cioldi, F. (1993). *The quantitative analysis of social representations*. London: Harvester Wheatsheaf.

Enneking, U., Neumann, C., & Henneberg, S. (2007). How important intrinsic and extrinsic product attributes affect purchase decision. *Food Quality and Preference, 18*, 133–138.

Giménez, A., Ares, G., & Gámbaro, A. (2008). Consumer attitude towards shelf life labeling: Does it influence acceptance? *Journal of Sensory Studies, 23*, 871–883.

Grupo Mercado Común (2003). *Reglamento Técnico MERCOSUR para la rotulación nutricional de alimentos envasados*. Montevideo: Grupo Mercado Común.

Guerrero, L., Claret, A., Verbeke, W., Enderli, G., Zakowska-Biemans, S., Vanhonacker, F., et al. (2010). Perception of traditional food products in six European regions using free word association. *Food Quality and Preference, 21*, 225–233.

Guerrero, L., Colomer, Y., Guàrdia, M. D., Xicola, J., & Clotet, R. (2000). Consumer attitude towards store brands. *Food Quality and Preference, 11*, 387–395.

Harcar, T., & Karakaya, F. (2005). A cross-cultural exploration of attitudes toward product expiration dates. *Psychology and Marketing, 22*, 353–371.

Henley, N. M. (1969). A psychological study of the semantics of animal terms. *Journal of Verbal Learning and Verbal Behavior, 8*, 176–184.

Hough, G., & Ferraris, D. (2008). Free listing: A method to gain initial insight of a food category. In *The 9th Sensometrics Meeting. Sensometrics 2008*. St. Catherine: Sensometrics Society.

Hough, G., & Ferraris, D. (2010). Free listing: A method to gain initial insight of a food category. *Food Quality and Preference, 21*, 295–301.

Hutchings, J. B. (2003). *Expectations and the food industry: The impact of color and appearance*. New York: Kluwer Academic/Plenum Publishers.

Jaeger, S. R. (2006). Non-sensory factors in sensory science research. *Food Quality and Preference, 17*, 132–144.

Makens, J. C. (1965). Effect of brand preference upon consumers' perceived taste of turkey meat. *Journal of Applied Psychology, 49*, 261–263.

Marshall, D., Sutart, M., & Bell, R. (2006). Examining the relationship between product package colour and product selection in preschoolers. *Food Quality and Preference, 17*, 615–621.

McDaniel, C., & Baker, R. C. (1977). Convenience food packaging and the perception of product quality. *Journal of Marketing*(October), 57–58.

McNeal, J. U., & Ji, M. F. (2003). Children's visual memory of packaging. *Journal of Consumer Marketing, 20*, 400–427.

Modell, S. (2005). Triangulation between case study and survey methods in management accounting research: An assessment of validity implications. *Management accounting research, 16*, 231–254.

Picard, D., Dacremont, C., Valentin, D., & Giboreau, A. (2003). Perceptual dimensions of tactile textures. *Acta Psychologica, 114*, 165–184.

Rodríguez Tarango, J. A. (2003). Introducción a la Ingeniería en Envase y Embalaje. In J.A. Rodríguez Tarango (Ed.), *Manual de ingeniería y diseño en envase y embalaje para la industia de los alimentos, farmacéutica, química y de cosméticos* (pp. 1:1–1:6). México: Instituto Mexicano de Profesionales en Envase y Embalaje S.C.

Roininen, K., Arvola, A., & Lähteenmäki, L. (2006). Exploring consumers' perception of local food with two different qualitative techniques: Laddering and word association. *Food Quality and Preference, 17*, 20–30.

Rozin, P. (1990). Social and moral aspects of eating. In I. Rock (Ed.), *The legacy of Solomon Asch: Essays in cognition and social psychology* (pp. 97–110). Lawrence Erlbaum: Potomac.

Rozin, P., & Tuorila, H. (1993). Simultaneous and temporal contextual influences on food acceptance. *Food Quality and Preference, 4*, 11–20.

Rusell Bernard, H. (2005). Free listing. In H. Rusell Bernard (Ed.), *Research methods in anthropology: Qualitative and quantitative approaches* (4th ed., pp. 301–311). Lanham, MD: AltaMira Press.

Schmitt, N. (1998). Quantifying word association responses: What is native-like? *System, 26*, 389–401.

Steenkamp, J. B. E. M., & van Trijp, H. C. M. (1997). Attribute elicitation in marketing research: A comparison of three procedures. *Marketing Letters, 8*, 153–165.

Stokes, R. C. (1985). The effects of price, package design, and brand familiarity on perceived quality. In J. Jacoby & J. C. Olson (Eds.), *Perceived quality* (pp. 233–246). Lanham, MD: Lexington Books.

Szalay, L., & Deese, J. (1978). *Subjective meaning and culture: An assessment through word associations*. Hillsdale, NJ: Erlbaum.

van Kleef, E., van Trijp, H. C. M., & Luning, P. (2005). Consumer research in the early stages of new product development: A critical review of methods and techniques. *Food Quality and Preference, 16*, 181–201.

Wagner, W., Valencia, J., & Elejabarrieta, F. (1996). Relevance, discourse and the hot stable core of social representations and structural analysis of word associations. *British Journal of Social Psychology, 35*, 331–351.

Wadsworth, G. (2000). Hearing midlife voices: Assessing different methods for researching women's experiences of menopause and midlife. *Women's Studies International Forum, 23*, 645–654.