



Chicken nuggets packaging attributes impact on consumer purchase intention

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Abstract

The aim of this study was to evaluate the influence of chicken nuggets packaging attributes on Brazilian consumer purchase intention. Focus group technique was employed in order to identify the relevant packaging characteristics. Forty consumers were interviewed in six sessions where five different types of chicken nuggets packaging were evaluated. After identifying the most relevant parameters for the study (color, picture, brand, and price), the impact of each characteristic (factor) on the purchase intent was evaluated. The conjoint analysis technique was applied to 100 consumers data. Eight stimuli (labels) were prepared by combining two levels for each factor using a fractional factorial design 2^{4-1} . The price significantly influences at the time of purchase, which was quantitatively confirmed by the conjoint analysis, demonstrating the importance of a product supplied with a competitive market price. The picture influences at the time of purchase more than color and brand. Despite having less relative importance, warm colors and a brand already associated with the product might contribute positively to purchase intention.

Keywords: breaded chicken; label; consumer perception; focus group; conjoint analysis.

Practical Application: To evaluate the influence of chicken nuggets packaging attributes on consumer purchase intention.

1 Introduction

Poultry production has significant economic importance not only in Brazil but also around the world. The Brazilian Animal Protein Association (ABPA) reported in 2016, a chicken meat consumption of 41.10 kg per capita. Additionally, in 2016 Brazil was the world's second largest producer after the USA and securing first place in worldwide exports (Brazilian Animal Protein Association, 2017). With a market growth, the chicken meat production sector has decided to invest in processed meat products in order to add value and to provide the convenience as required by chicken meat consumers. Constant change in consumers profile is verified due to longer working hours and consequently a reduction in time availability for food preparation.

Restructured breaded products, such as nuggets, are a consumption alternative to chicken meat widely accepted by consumers. Their main raw materials include chicken cuts, mechanically separated meat and skin. Preparation involves chicken muscle ground by a mechanical process, followed by mixing the remaining ingredients (Barros et al., 2018). Thus, chicken nugget are battered and breaded, then deep-fried or baked and finally are quick frozen (Tamsen et al., 2018).

Liking or disliking a food product involve the consumers' expectations and attitudes (Meier-Dinkel et al., 2013). Food selection and consumption are complex phenomena influenced by various factors that can be classified as marketing, psychological, and sensory related (Carneiro et al., 2005). Some studies have been

demonstrated that the same samples presented in two different way, blind and informed, can change the perception of consumers regarding acceptance and/or attributes (Andrade et al., 2018; Grasso et al., 2017; Hersleth et al., 2015; Resano et al., 2007). There is a strong segmentation in which consumers consider packaging elements most relevant. Some consumers are mostly oriented toward the visual esthetics, while a small segment focuses on product label details. Segmentation variables based on packaging response can provide very useful information to help marketing specialists maximize the package's impact (Silayoi & Speece, 2007). Considering packaging attributes influence on consumer purchase decisions for food and, as a consequence, on its consumption, packaging improvement should be continuous. Thus, the effects of package/label attributes and product information on consumer attitudes towards product evaluation have been widely studied (Koutsimanis et al., 2012; Carneiro et al., 2005).

Two techniques have been used in this regard: focus group and conjoint analysis. The focus group qualitative method is based on group dynamics concepts with an exploratory character, in order to provide ideas about preferences, incentives, and barriers to certain behaviors. It allows participants to explain the motivations and reasons for their attitudes, preferences, and perceptions in a roundtable session conducted by an impartial moderator (Lawless & Heymann, 2010). The conjoint analysis

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is applied for combining the effects of two or more independent variables on a dependent one, usually subjective, which measures consumer opinion regarding the product in question. The analysis is based on the fact that consumers evaluate product value by combining the contributions of each factor that comprises it (Carneiro et al., 2010).

Considering the importance of Brazilian poultry industry incentives in processed meat products sales, packaging influences on food purchase decisions, and since studies in this area are scarce for chicken nuggets, it is necessary to verify packaging attributes that can interfere with the product's purchase intent, whose consumption and acceptance have increased. These data types could assist in developing marketing strategies and packaging that could increase competitiveness for this products range. Thus, the aim of the present study was to evaluate the influence of packaging attributes in Brazilian consumer purchase intention for chicken nuggets.

2 Materials and methods

Components and packaging information impacts on chicken nuggets purchase were evaluated by focus group and conjoint analysis techniques. This study was authorized to collect responses from consumers by the National Research Ethics System (Project 304 832 CEI, CAAE 18265613.5.0000.0092).

2.1 Survey of relevant attributes for chicken nuggets purchase - Focus group

At this stage of the study, 40 chicken nuggets consumers were selected and interviewed in 6 sessions with groups of 5 to 8 individuals each, lasting no more than 90 min. Five chicken nuggets packs of different brands were used without any price identification. They were presented to the consumers in a sequential monadic manner during interviews. The packaging selection criteria were based on different characteristics, such as size, color, weight, composition, information, images, and letters/fonts. Table 1 shows a brief description of each packaging.

Consumers were encouraged by the moderator to express their views. In order to standardize the conduct in the various sessions, the following set of questions was employed: 1. Do you look at the labels of products you consume? 2. What does draw your attention to the labels of products you consume? 3. What do you think of this packaging? 4. What do you consider important in this packaging? 5. What are the negative and positive characteristics that this packaging shows? 6. Is your purchase decision influenced by nutritional information and ingredients? 7. Would you like to see any other information? 8. Would you like to see changes in terms of packaging design (shape, color, etc.)? 9. Would the price have an influence on the purchase of this product?

At the end of each session, all packages were jointly evaluated; each consumer presented his or her overall assessment and placed the packages in descending order of acceptance, justifying their criteria. Data obtained through questionnaires and responses notes were analyzed by considering words used, questions context, and responses specificity. Responses were represented as percentages when possible (Corso & Benassi, 2015).

2.2 Evaluation of chicken nuggets packaging factors that impact purchase intention - Conjoint analysis

One hundred consumers were recruited for this analysis based on a socio-demographic data and consumer habits questionnaire regarding chicken nuggets. The consumers recruited had at least 25% of responsibility of family purchase. They were divided into 10 sessions. Four factors (color, image, brand, and price) were selected by the focus groups as relevant to chicken nuggets purchase intention. Two levels were defined for each factor: color (level -1: cool color (green and blue blend) and level +1: warm color (yellow and red blend); image (-1: simple (plate with whole nuggets), and +1: complete (plate with cut nugget giving off steam); brand (-1: associated (nuggets product with known brand) and +1: not associated (network brand recognized but not yet used for nuggets), and price (-1: cheaper and +1: more expensive). The factors were analyzed using a fractional factorial design 2⁴⁻¹. Eight stimuli profile (label images) were generated by a combination of factors and levels, avoiding a large number of

Table 1. Short description of chicken nuggets packaging used in focus group.

Packaging / brand	Description ^a
A/1	Carton with a label printed directly on the paper box with dark blue and white core. Front illustrations: cut and whole cheese-filled nuggets filled (oozing) and ham, accompanied by radishes and yellow sauce with green spices. Back illustrations: the same as front illustrations. Front package information in black and white font colors
B/1	Carton with a label printed directly on the paper box with red and white colors. Front illustrations: whole nuggets on a plate and cut nugget pricked with a fork next to a sauce bottle.
C/2	Carton with a label printed directly on paper box with light green, blue, and white colors. Front illustrations: picture split into two sides, one side with whole nuggets on a plate accompanied by a tomato and small green leaves, and another one with a cut nugget stuck on the edge of a fork and a small picture of a family.
D/3	Carton with a label printed directly on the paper box with yellow, red, and white colors. Illustrations: a dish with nuggets and a small pink tomato with a branch of green leaves.
E/1	Carton with a label printed directly on the paper box with purple and white colors. Illustrations: whole star-shaped nuggets, with one held by a male cartoon character and a female cartoon character sitting on a swing. Vitamin source is presented on the front packaging.

^a All packagings presented nutritional information, preparation methods, home storage conservation, and customer service information.

treatments to the individuals' risk of fatigue and, consequently, a non-critical evaluation, as described by Carneiro et al. (2005). The images were prepared using PowerPoint software (Microsoft 2007, San Francisco, USA). Two label images examples are presented in Figure 1.

The adopted procedure for the analysis was similar to that used by Corso & Benassi (2015). Firstly, all labels were presented on the same slide so that consumers could have an overall view of them, as on a supermarket shelf. Subsequently, the labels were presented in a sequential monadic manner and coded with a random three-digit number. The images presentation order was randomized for each session. The sample number was shown as each packaging image was presented and consumers assessed their purchase intention. A structured seven-point scale, anchored at the ends with the phrases 'I would definitely not buy it' and 'I would definitely buy it', was used.

The eight stimuli produced by the combination of the four most relevant factors were analyzed using threading clusters model (Moore, 1980), and preference coefficients values were initially analyzed individually by consumers. The cluster analysis was performed using the average distance between groups criterion and the Euclidean distance as a similarity measure, grouping model-suited individuals consumers who showed similar preference coefficients formed groups; therefore, having similarities in

their purchase intention. An aggregate analysis was performed for each group in order to estimate preference coefficients and each factor relative importance by the group, considering the estimated averages in the individual model (Carneiro et al., 2010). Data checking consistency was performed as suggested by Moskowitz et al. (2005), considering the determination coefficients (R^2) values for each individual. Statistical analyses were performed by Transreg and Cluster procedures using SAS software (version 9.1.3, North Carolina, USA).

3 Results and discussion

3.1 Focus group

Consumers who took part in the focus groups sessions were residents in the southern state of Paraná in Brazil; 62.5% females, and 37.5% males. They were young (27.5% aged 18-24, 40% aged 25-39, 20% aged 40-50, and 12.5% aged 50-over), and varied in education levels (17.5% were elementary school graduates, 57.5% high school graduates, 7.5% university graduates, and 17.5% were university undergraduates). Income was heterogeneous, considering that 17.5% of consumers earn up to 1 monthly minimum wage (equivalent to BRL 678.00), 55% up to 2 monthly minimum wages, 15% up to 3 monthly minimum wages, and 12.5% up to 4 monthly minimum wages. All participants were chicken nugget consumers: 37.5% prefer them baked and 62.5% prefer them fried. In terms of a weekly basis consumption; 2.5% consume it three to five times a week, 20% consume it twice a week, 42.5% consume it once a week, and 35% consume it less than once a week.

Table 2 shows a summary of the most frequent responses in the four focus group sessions for five chicken nuggets packages. There was an overall preference for warmer colors, such as red and yellow (B and D, respectively), and consumers suggested blending these colors to form a packaging more pleasing to the eyes. The dark blue and light blue/light green color packaging (A and C, respectively) pleased consumers only partially, as they were too heavy and too weak, respectively. The lilac color packaging (E) had a high rejection response by most consumers, who considered such color unsuitable for food products packaging.

There was a consensus among consumers regarding pictures, where real nuggets photographs attract more consumers' attention. The presence of side dishes also pleased consumers. The presence of a fork (C) did not please everyone, as some considered it too large, but those who liked it reported that it could be part of the image since it is generally used on nuggets consumption. There was a consensus among consumers regarding the importance of product image viewing. This feature is influential on product purchase intention, since when ordering preferences, packaging E (packaging with a child's image) was placed fifth (last position), and only 2.5% of consumers placed it first. Many consumers said the product image remained in the background, as the child's image was prominent on the packaging.

The price factor was often considered as important to the purchase intention. However, if the desired brand was priced closely to another one, consumers would choose by brand, regardless of price. Consumers mentioned that market-good products might exist at competitive prices, yet brand confidence



Figure 1. Labels used in conjoint analysis: stimulus 1 (A) and stimulus 8 (B).

Table 2. Summary of most frequent responses obtained in four sessions from the focus groups.

Item	Nugget	Responses
Color (packaging, letters, or figures)	A	Lack of color to highlight packaging. Heavy color. Some consumers like the blue color, but they think it is a strong tone.
	B	Strong color, flashy, refers to the brand; good packaging color contrast with the company logo (light red to dark red); the packaging and writing, highlighting the information. Pretty color, easy-to-read information.
	C	Packaging color gives a feeling of lightness, pleasing to some consumers. The colors used could be stronger and more vivacious as they did not attract attention. The color used makes it look like a medicine carton. The blending of colors (green and blue) and the packaging color division did not please.
	D	The color attracts attention and is flashy. The white color of the information did not please. The combination of colors (yellow with red) pleased. Customer service information is highlighted in another color, which was considered easy to view.
	E	The color of the packaging did not please or call attention. The colors of the letters on the back of the packaging should be of a different color because they are difficult to see. The background color of the tables should be different from the box's color.
Figure	A	The photograph is clear and attractive. The barcode in heart form was considered creative and memorable. The accompanying figures pleased, but for some consumers, it would be better if it was just a green salad, because the product would be highlighted.
	B	The barcode in heart shape is creative. The smoke/steam is attractive, because it relates that the product is consumed hot. It has a recycling seal. The product design could be better. The letters above the product figure and the fork did not please. The accompaniments pleased.
	C	The figures distribution did not please. The nugget figure is not attractive and it gives a feeling of being 'dry'.
	D	The company logo is well highlighted. The preparation method is well placed and in the form of figures. The nugget picture gives a feeling of being 'dry'. Clean figure without writing above. The picture could have something more to be more attractive (cut nugget and smoke). The nuggets could be cut and be a more defined shape.
	E	The product remained in the background. Figures of children's cartoons are highlighted, but there is a lack of product figure emphasis. Figures were lost. Figures look like they were glued. Product name is very large and hid the product figure.
Information	A	Repeated information on both sides of the packaging. The preparation method is difficult to be visualized. The Braille writing pleased. The font sizes are larger and more readable.
	B	Legible letters. The title would be better with initial capital letters. The expiration date could be highlighted more. The Braille writing pleased. Information is well placed, and the tables were visible. The preparation method is written but easy to locate.
	C	The nutritional table is very small. The information has small letters. The expiry date was highlighted for easy viewing. The storage temperature is easy to see. The product's name in English did not please. Customer service information is difficult to see.
	D	Flashy and interactive preparation method. The presentation of other products of the brand was interesting. The nutritional information and expiration date could be higher, because there is space. The information is well placed.
	E	The expiration date is off and difficult to view. The information has very small letters. The nutritional table is hidden. The packaging is extravagant, with a lot of information and no organization. The vitamins and iron information pleased.

proved to have great influence on consumer choice. A sensory study involving dry-cured ham samples evaluated without price indication had higher buying probability related to samples with price indication. Thus, the relatively high price seems more important, even if any high-hedonic expectations of dry-cured ham among consumers could not neutralize the price effect. According this authors, when consumers choose a product in the shop, they do so based on previous experience as the price and brand, reinforcing the importance of this attributes (Hersleth et al., 2015).

Packaging shapes and sizes were not much mentioned by consumers and the majority considered the 300 g portion ideal. The 500 g (product A) portion proved to be innovative in product display, both vertically and horizontally. There were no suggestions for any changes in terms of packaging design.

It was reported that a well-placed expiry date helps consumers at purchase time so they do not have to spend too much time trying to locate the printed area. There was a preference for larger letters and prominently located information, such as expiry date, nutritional table, and customer service. The interactive preparation method, represented by figures, was also pleasing.

The feature of other products of the same brand on the packaging was considered helpful since many consumers said they would like to see different same-brand-products so they could choose what they want before purchase time.

Packaging pictures and colors were the most discussed aspects during sessions. Packaging A was ordered firstly on purchase intent by 42.5% of consumers and B by 30% of them. Consumers reported choosing image and color during packaging evaluation, respectively. Notably, the picture on packaging A was of cheese-filled nuggets, which is not suitable for conventional products and used in the sessions only to show different carton color options (dark blue) and display positioning (horizontally and vertically). Packaging D obtained 20% of total purchase intentions and consumers said they would buy it because they trust the brand. Packagings C and E were the first choices only by 5% and 2.5% of consumers, respectively.

Considering the results obtained in all sessions color, front picture, brand, and price proved to be the most relevant factors for product choice. Therefore, such factors were selected for a quantitative impact study on purchase intention by conjoint analysis.

3.2 Conjoint analysis

The higher the R² value the greater the responses' consistency degree of each individual in total review concepts by measuring the model fit quality for the actual data. A 0.66 determination coefficient (R²) was considered a consistent evaluation, meaning the individual paid attention to the test's combinations. Studies report that between 75% and 97% of subjects had R² ≥ 0.66 (Corso & Benassi, 2015; Chung et al., 2011; Moskowitz et al., 2005) and data quality using all individuals in the aggregate analysis was high. Figure 2 shows R² profiles for 100 consumers, in which 76% had R² ≥ 0.66, presenting an adequate data quality. Thus, the results from all individuals were maintained.

Consumers were residents in the southern state of Paraná in Brazil; 70% female, and 30% male. They were young (65% aged 18-29, 14% aged 30-39, and 21% aged 40-over), and 73% were either elementary or high school graduates, 15% were university graduates, and 12% university postgraduates. Family income was predominantly 1-5 monthly minimum wages (89%), followed by 5-10 monthly minimum wages (10%), and above 10 monthly minimum wages (1%). Regarding groceries purchasing responsibility at home, 51% had 75-100% purchase responsibility, whereas 49% had between 25-50% purchase responsibility. Packaging characteristics observed at purchase time were price (83%), brand (63%), expiry date (52%), ingredients (16%), pictures (15%), colors (14%), nutritional information (12%), and shape (9%). The three most cited characteristics in the present work were also the ones most cited in Della Lucia et al. (2007) study on roasted and ground organic coffee packaging. In this study, however, the expiry date was the most visualized item (89.6%), followed by price (77.8%), and product brand (73.6%). 95% of consumers reported reading labels (37% often, 33% occasionally, and 25% always). All participants were chicken nuggets consumers:

2% consume it three times a week, 16% once a week, 17% once a month, and 65% consume it occasionally.

Regarding the consumers who took part in this study, three groups were obtained by cluster analysis, comprised of 56, 33, and 11 consumers, respectively (total number of consumers = 100). Table 3 shows attribute levels, relative importance, and preference coefficients of each consumers group. The preference coefficients represent each contribution level of each factor (attribute) for overall liking, represented by values and signs. The greatest utility degree values indicate the components that correspond to a greater acceptance label. The negative sign represents a negative influence on certain consumer groups purchase intention, and the positive sign indicates the opposite (Carneiro et al., 2006).

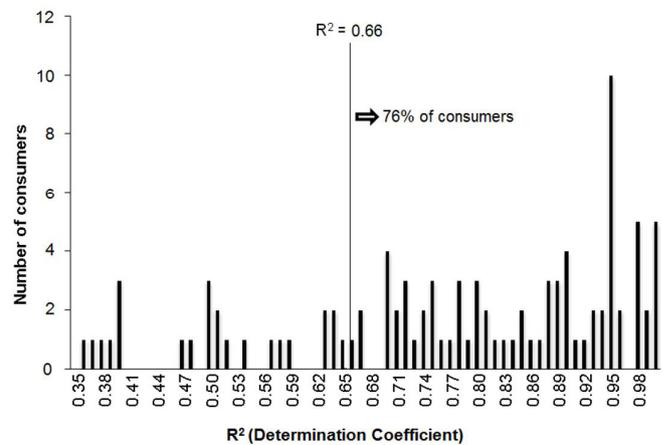


Figure 2. Consistency of consumers reaction to the set of images.

Table 3. Aggregated analysis results for each consumer group (n = 100).

Attributes and levels	Part-worth*		
	Group 1 (n = 56)	Group 2 (n = 33)	Group 3 (n = 11)
<i>Packaging color</i>			
Cool (-1)	-0.10 ^a	0.08 ^a	-0.38 ^b
Warm (+1)	0.10 ^a	-0.08 ^a	0.38 ^a
Relative importance (%)	7.19	7.64	13.42
<i>Picture</i>			
Basic (-1)	-0.49 ^b	0.93 ^a	0.28 ^a
Complete (+1)	0.49 ^a	-0.93 ^b	-0.28 ^a
Relative importance (%)	36.62	82.64	10.16
<i>Brand</i>			
Associated (-1)	0.22 ^a	-0.00 ^a	0.51 ^b
Not associated (+1)	-0.22 ^b	0.00 ^a	-0.51 ^a
Relative importance (%)	16.56	0.69	18.29
<i>Price</i>			
Cheaper (-1)	0.53 ^a	0.10 ^a	1.63 ^a
More expensive (+1)	-0.53 ^b	-0.10 ^a	-1.63 ^b
Relative importance (%)	39.63	9.03	58.13

* Coefficients with a positive sign indicate a positive impact on consumer purchase intention. Different letters in the same column for the same attribute and group denote a significant difference (p<0.05) by Tukey's and Fisher's tests.

Group 1, represented by approximately half the consumers (56%), evaluated price (39.6%) and picture (36.6%) factors as of greater relative importance. They preferred low-priced labels and complete pictures showing side dishes. Brand and color factors with lower relative importance were not decisive in product purchase. This group was young (69.1% age between 18 and 29) and composed by 71.7% of women. The majority completed high school (50.0%) and 23.2% completed elementary school and the same percentage were graduated. The nuggets consumption frequency was mainly occasional (62.5%). Similar results were reported by Hersleth et al. (2015) regarding the price importance on buying probability. When dry-cured samples were present with higher price the buying probability reduced related to the same samples presented without price.

Group 2, comprising 33% of consumers, said the picture was the deciding factor in product purchase, with 82.6% of relative importance. However, this group differs from group 1 as a more basic picture was preferred. The other evaluated attributes showed no influence on purchase intention for this group. This group was characterized as young (63.6% age between 18 and 29), composed by 69.7% of women. The occasional nuggets consumption predominated (72.7%) and 12.1% completed elementary school, 54.5% completed high school and 27.3 were graduated. Although this group did not indicate a high relative importance for price, 90.9% of consumers mentioned that they look the price at the purchase time.

The price was the highest relative importance (58.1%) factor for group 3, making 11.0% of consumers, probably because it was formed entirely by consumers (100%) who claimed to earn 1-5 monthly minimum wages. Other peculiar characteristics of this group include the higher predominance of women (81.8%), wide age group (45.5% between 18 and 29 years and 54.5% between 30 and 49 years) and equilibrated education level (18.2% completed elementary school, 63.6% completed high school and 36.4% were graduated). This group showed a high once a week nuggets consumption frequency (36.4%, compared to 16.1% and 9.1% for group 1 and 2). Low price significantly increases ($p < 0.05$) purchase intention for group 3, similar to groups 1 and 2, Brand factor (18.3%) had a small influence on consumer choice, similarly to group 1, associated brand had a positive impact on purchase intention.

In general, price and image factors had the greatest influence on consumers' choice. A lower price had a positive influence on chicken nuggets purchase decision for 100% of consumers. The price was mentioned on the consumers' habits questionnaire as the most visualized item at purchase time (83% of consumers). In their study on roasted and ground organic coffee packaging, Della Lucia et al. (2007) reported that price influenced all individuals' purchase intention, with the relative importance varying from 30.1% to 77.1%.

Despite picture's influence observed by consumers, such factor at purchasing time was cited only by 15% of participants. The complete picture appeared to have a positive effect on the purchase intention of 56% of consumers. Brand had less impact than price and picture, with relevance for groups 1 and 3 (67% of consumers) claiming that a famous well-known brand associated with a chicken nuggets product positively affects the

purchase. The color factor showed no impact on the purchase decision, however, for groups 1 and 3 (67% of consumers) warm colors (yellow/red) caused a positive effect on purchase intention.

4 Conclusion

Packaging colors, pictures, and font sizes, which cause difficulties for consumers to understand the message, were widely mentioned in the focus groups analysis. Product price and brand were identified as important factors on purchasing decision. Consumers said the price attribute significantly influences at purchasing time, which was quantitatively confirmed in the factors analysis, demonstrating the importance of a product supply with a competitive market price. In the analysis, the product's front picture was the second most important item for purchase. This highlights the importance of suitable front pictures, showing the inside and outside of the chicken nugget, steam coming out of the product, and side dishes suggestions. Despite having less relative importance, warm colors and a brand already associated with the product could contribute positively to purchase intention.

However, we highlight that such findings are restricted to Brazilian consumers, and despite Brazil's prominence on poultry market with its great production, exports, and consumption potentials, studies with consumers from other countries could be attractive for gathering information to suggest a packaging for a wider target public. Likewise, future studies evaluating sensory acceptance of similar meat products packages could offer a better understanding of consumers perception and behavior.

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