

## Evaluating the soybean oil packaging characteristics in Brazilian Midwest region

Avaliação das características da embalagem de óleo de soja na região Centro-Oeste brasileira

Evaluación de las características de los envases de aceite de soja en la región del Medio Oeste de Brasil

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**Eduardo José Oenning Soares**

ORCID: <https://orcid.org/0000-0002-3548-6579>

Mato Grosso State University, Brazil

E-mail: [eduardo.oenning@unemat.br](mailto:eduardo.oenning@unemat.br)

**Rodolfo Benedito Zattar da Silva**

ORCID: <https://orcid.org/0000-0003-2075-5622>

Federal University of Mato Grosso, Brazil

E-mail: [rodolfoengenheiro@hotmail.com](mailto:rodolfoengenheiro@hotmail.com)

**Alexandre Gonçalves Porto**

ORCID: <https://orcid.org/0000-0002-5966-1888>

Mato Grosso State University, Brazil

E-mail: [porto@unemat.br](mailto:porto@unemat.br)

**Jéssica Ramos de Oliveira**

ORCID: <https://orcid.org/0000-0003-1450-3859>

Mato Grosso State University, Brazil

E-mail: [jessica-r24@hotmail.com](mailto:jessica-r24@hotmail.com)

### Abstract

The main goal of this study is to evaluate the influence of soybean oil packaging attributes on consumer preferences in Brazilian Midwest region using Multivariate Data Analysis. Four packaging attributes were evaluated: the presence of additional information on label of packaging, brand (popular and non-popular), type of soybean (genetically modified and non-genetically modified) and shape of the packaging (conventional and innovative). Eight images were evaluated by 400 consumers in Midwest region of Brazil. We used the Conjoint Analysis to analyze and measure the impact of each product attribute in consumer preference. The results show that, in general, the consumers were influenced positively by the presence of additional information, innovative package, popular brand and non-transgenic soybeans. Some groups of individuals could not distinguish or did not care about genetically modified soy. Further studies are recommended to evaluate if consumers have difficulties to interpret the symbols on the packaging label (transgenic or organic, for example), as well as it is necessary to extend this survey to other Brazilian states. The food industry will be able to develop packaging and marketing strategies using consumer profiles. The study is useful for the definition, modification and adaptation of soybean oil products.

**Keywords:** Conjoint analysis; Packaging foods; Innovative package; Transgenic soybean.

### Resumo

O principal objetivo deste estudo é avaliar a influência dos atributos das embalagens de óleo de soja nas preferências do consumidor na região Centro-Oeste brasileira, utilizando a Análise Multivariada de Dados. Foram avaliados quatro atributos da embalagem: presença de informações adicionais no rótulo da embalagem, marca (popular e impopular), tipo de soja (geneticamente modificada e não geneticamente modificada) e formato da embalagem (convencional e inovadora). Oito imagens foram avaliadas por 400 consumidores na região Centro-Oeste do Brasil. Foi utilizada Análise Conjunta para analisar e medir o impacto de cada atributo do produto na preferência do consumidor. Os resultados mostram que, em geral, os consumidores foram influenciados positivamente pela presença de informações adicionais, embalagem inovadora, marca popular e soja não transgênica. Alguns grupos de indivíduos não conseguiram distinguir ou não importar com soja geneticamente modificada. Estudos adicionais são recomendados para avaliar se os consumidores têm dificuldades para interpretar os símbolos no rótulo da embalagem (produtos transgênicos ou orgânicos, por exemplo), bem como é necessário estender essa pesquisa para outros estados brasileiros. A indústria de alimentos poderá desenvolver estratégias de marketing usando perfis de consumidores. O estudo é útil para a definição, modificação e adaptação de derivados de soja.

**Palavras-chave:** Análise conjunta; Embalagem de alimentos; Embalagem inovadora; Soja transgênica.

## Resumen

El objetivo principal de este estudio es evaluar la influencia de los atributos de los envases de aceite de soja en las preferencias de los consumidores en la región del Medio Oeste de Brasil, utilizando el Análisis de Datos Multivariados. Se evaluaron cuatro atributos del envase: presencia de información adicional en la etiqueta, marca (popular y no popular), tipo de soja (modificada genéticamente y no modificada genéticamente) y formato (convencional e innovador). Ocho imágenes fueron evaluadas por 400 consumidores en la región del Medio Oeste de Brasil. Se utilizó el análisis conjunto para analizar y medir el impacto de cada atributo del producto en la preferencia del consumidor. Los resultados muestran que, en general, los consumidores se vieron influenciados positivamente por la presencia de información adicional, envases innovadores, marca popular y soja no transgénica. Algunos grupos de individuos no pudieron distinguir o no importar soja genéticamente modificada. Se recomiendan estudios adicionales para evaluar si los consumidores tienen dificultades para interpretar los símbolos en la etiqueta de los envases (productos transgénicos u orgánicos, por ejemplo), y es necesario extender esta investigación a otros estados brasileños. La industria alimentaria podrá desarrollar estrategias de marketing utilizando perfiles de consumidores. El estudio es útil para definir, modificar y adaptar los derivados de la soja.

**Palabras clave:** Análisis conjunto; Envasado de alimentos; Envasado innovador; Soja transgénica.

## 1. Introduction

Brazil is one of the largest soybean producers in the world and the Midwest Region is responsible for a large part of this production, in a prominent position in national agribusiness. Moreover, the soybean oil is the most consumed vegetable oil in Brazil, because of the lower price and high availability in the domestic market, however, the packaging of this oil shows low differentiation, i.e., colors, shape, labels and design of the packaging are very similar.

Considering the high level of food industry competition, companies should seek new ways to add value to the product. In this sense, marketing research can be a good way to understand the consumer behavior and their preferences, thus establishing new strategies and developing new products or technologies to achieve new consumers (Varandas Jr. & Miguel, 2012; Oenning et al., 2017). This type of research provides food companies with a great opportunity to ensure economic and administrative prominence to face their competitors.

Regarding to food industry, the packaging is used as a source of information and recognition, serving as suggestion of extrinsic quality and brand image (Ares et al., 2010; Liu & Chou, 2015; Méndez et al., 2011). In this sense, the food packaging plays an important role in attracting consumers' attention and can influence their purchase intention in marketing strategies, assisting in product management in agribusiness (Gadioli et al. 2013; Gutjar et al. 2014; Oenning et al., 2017).

Despite the importance of performing sensory analysis (Braga & Andrade Junior, 2015; Corradini et al., 2013; Guimarães et al., 2019; Silva et al., 2021), the consumer decision to accept and purchase a food product requires not only the identification of sensory properties, but also several external features (Dantas et al., 2004; Silva, et al., 2021). Attributes such as color, package material, shape, size, information on the labels, devices to facilitate handling package, etc., are important in the evaluation process of a food product packaging and should be combined to attract consumers (McNeal & Ji 2003). The effect of these packaging attributes and the consumer preferences evaluation have been studied in the literature (Ares & Deliza, 2010; Carneiro et al., 2005; Carneiro et al., 2019; Della Lucia et al., 2007; Gadioli et al., 2013; Giancristofaro & Bordignon, 2016; Lima Filho et al., 2015; Muratore & Zarbà, 2011; Oenning et al., 2017; Queiroz et al., 2016; Romano et al., 2015; Schnettler et al., 2012).

The information about the consumer preference structure may yield not only advantages for soybeans oil companies, but also to all food productive chain, reaching all agribusiness economy and administration of this sector, improving and widening the differentiation of the products. However, there is a challenge to quantify the effect of each package attribute on consumer purchase intention. In this case, the Conjoint Analysis (CA) is a multivariate data analysis statistical method that has been widely employed.

Considering what is presented above, the main goal of this study is to evaluate the influence of soybean oil packaging

attributes on consumer preferences in the Brazilian Midwest region using multivariate data analysis to measure degrees of consumer preference.

## **2. Methodology**

### **2.1 Participants**

The study was submitted and approved by the Research Ethics Committee of Mato Grosso State University (UNEMAT), Brazil, under the number 44452715.4.0000.5166.

The study was conducted in two capitals of the Brazilian Midwest region, Cuiabá (State of Mato Grosso) and Goiânia (State of Goiás) using convenience sampling. Four hundred (400) adults were randomly recruited in the vicinity of major supermarkets in the region, two hundred people in Goiás and two hundred people in Mato Grosso, between 2016 and 2019. Approximately 55% were women and 45% were men, with an average age of 37 years ( $sd=11.8$ ). We considered only those participants who reported to purchase soybeans oil regularly (at least monthly).

### **2.2 Establishment of stimuli**

The product selected for research in this study was soybean refined oil, of 900ml PET bottles (polyethylene terephthalate). To generate valid stimuli, attributes were selected to be independent and occupying mutually exclusive levels (Hair Júnior et al., 2010). The stimuli were formed using four major packaging attributes as presented in the literature: shape of packaging, additional information on the label, brand and type of soybean, i.e., if it was transgenic (genetically modified) soybeans or not (Ampuero & Vila 2006; Ares & Deliza 2010; Ares et al., 2010; Carneiro et al., 2005; Cerjak et al., 2010; Di Monaco et al., 2003; Hoppert et al., 2012; Muratore & Zarbà 2011; Vázquez-Araújo, et al., 2012).

In the literature, some authors consider that additional information on food packages label are important attributes of consumer purchasing decisions (Carneiro et al., 2005; Dossin et al., 2019; Gadioli et al., 2013; Hoppert et al., 2012; Lima Filho et al., 2015; Romano et al., 2015; Vázquez-Araújo, et al., 2012; Oenning et al. 2017). Thus, we considered the absence or presence of additional information prominently displayed on the packaging. In this sense, we choose the sentence “5x more refined” and “zero % of trans fat” because it is common in some vegetable products packages in Brazilian supermarkets.

Maruyama et al. (2019) in a study on brand construction highlights that it contributes to the formation of a social identification of the individual, influencing the purchase decision of the same. Research also suggested that familiar brands influence the purchase behavior of the consumer regarding to loyalty (Oliveira & Spers, 2018; Ares et al., 2010; Carneiro et al., 2005). Thus, two brands were considered, one popular or familiar (most known) and other nonpopular or unfamiliar (less known). Previous studies were conducted in supermarkets in the region to assess which brands were most known and less known. Thus, to represent the popular and nonpopular brands two brands were chosen in the regional market.

With the biosecurity law (11.105/2005), the Brazilian government requires companies to highlight on the food products' labels terms such as transgenic (Brasil, 2010). However, there is currently a great debate about the obligation of this information on food labels. Furthermore, according to Carneiro et al. (2005), consumers were concerned with the origin of the foods, and this concern includes genetically modified products. In this sense, it was considered this attribute and highlighted if it was a Genetically Modified (GM) product with a symbol on the label.

Some researchers have highlighted that consumers value the shape and easy-to-use food packaging (Ares & Deliza 2010; Giancristofaro & Bordignon 2016; Muratore & Zarbà 2011; Oenning et al. 2017). In this way, it was considered an innovative shape that facilitates the package using. The packaging was shown with or without a handle, thus, the shape was labeled as innovative or conventional, respectively.

The total number of stimuli generated using these four attributes and two levels was 24=16. However, to ensure the quality of responses to the survey, the interview should be brief (Hair Júnior et al., 2010) and thus, it was developed a fractionated factorial experimental design to reduce the number of stimuli. This process resulted in a total of eight stimuli to make the research instrumentally manageable for respondents. Table 1 presents the combinations of stimuli generated.

**Table 1.** Stimuli generated by fractionated factorial experimental design with packaging attributes and levels.

Stimuli	Brand	Type of soybean	Additional information	Shape
1	Nonpopular	GM	Without information	Conventional
2	Popular	Non-GM	Without information	Innovative
3	Nonpopular	GM	Without information	Innovative
4	Nonpopular	Non-GM	With information	Innovative
5	Popular	Non-GM	Without information	Conventional
6	Popular	GM	With information	Innovative
7	Nonpopular	Non-GM	With information	Conventional
8	Popular	GM	With information	Conventional

Source: The authors themselves.

### 2.3 Image manipulation

Eight images were created from stimuli generated by the fractionated factorial experimental design. The images were drawn using Inkscape software (Inkscape, 2016). Then, the images were printed on glossy paper and bound in a transparent file folder. Each image has been shown individually to the participants. Figure 1 exemplifies the additional information attributes, type of soybeans and brand on the labels.

The Figure 2 presents images of stimuli 8 and 4 according to Table 1, respectively. As it can be seen, the Figure 2a shows a popular brand, additional information, type of GM soybeans and traditional shape of packaging, i.e., without handle. On the other hand, the Figure 2b presents a nonpopular brand, additional information, type of non-GM soybeans and innovative shape of packaging, i.e., with handle. The labels were also shown to the side of the packaging, so the attributes could be better viewed by the participant.

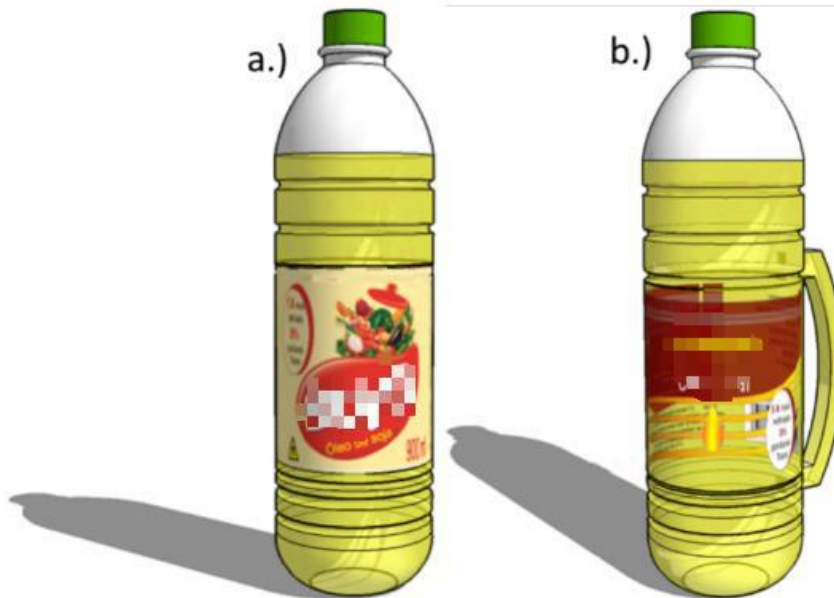
Here, the images were blurred and altered to preserve the identity of the brands. However, we show the original images to the participant.

**Figure 1.** Examples of two labels used in the study.



Source: The authors themselves.

**Figure 2.** Images of soybean oil packaging: a.) stimuli 8; b.) stimuli 4.



Source: The authors themselves.

#### 2.4 Consumer evaluation and data analysis

Participants were asked about the demographic data, as age, gender, level of instruction and income. Then, the participants were asked to evaluate their preference about the soybeans oil packaging using a nine-point hedonic scale (1=not preferred, 9=strongly preferred), marking the eight cards containing the stimuli and using the eight generated images.

In the data analysis, firstly the preference data were individually submitted to a conjoint analysis, thus the part-worth and relative importance for each consumer were calculated. The basic mathematical model of conjoint analysis can be represented by the following Equation 1:

$$U(X) = \sum_{i=1}^m \sum_{j=1}^{k_i} a_{ij} x_{ij} \quad (1)$$

Where  $U(X)$  is the overall utility of an alternative,  $a_{ij}$  is the part-worth utility associated with the  $j^{\text{th}}$  level of the  $i^{\text{th}}$  attribute;  $k_i$  is the number of levels of attribute  $i$ ;  $m$  is the number of attributes; and  $x_{ij} = 1$  if the  $j^{\text{th}}$  level of the  $i^{\text{th}}$  attribute is present and 0 otherwise.

The importance of an attribute  $i$  is defined in terms of part-worth range through the level of this attribute. In addition, the importance of an attribute  $i$  relative to other attributes is determined by Equation 2 (Hollebeek et al., 2007; Malhotra, 2012).

$$RI_i = \frac{\max(a_{ij}) - \min(a_{ij})}{\sum_{i=1}^m \max(a_{ij}) - \min(a_{ij})} \quad (2)$$

Where  $RI_i$  is the relative importance of the  $i^{\text{th}}$  attribute, and  $\sum_{i=1}^m RI_i = 1$ . Thus, the RI can be interpreted as the weight that each attribute carries for someone's decision, i.e., the weight of the attribute in the utility function.

Secondly, ANOVA test was performed on each individual result in order to identify no significant effect for, at least one, of the package attributes ( $p < 0.10$ ), thus, the consumers who did not fit the model were excluded from the dataset. Later on, a hierarchical analysis of the groups was performed from the data of relative importance to identify groups according to their similarities. Euclidean distance and the Ward aggregation method were used.

After the groups formed, the differences between the groups' gender, level of instruction, origin State, age and income distributions were evaluated using the chi-square test to k proportion with Marascuilo procedure ( $\alpha = 0.05$ ). The differences between the groups' part-worth and relative importance scores were evaluated using Kruskal-Wallis multiple comparisons test at  $\alpha = 0.05$ . All statistical analyses were performed using XLSTAT software (Addinsoft, 2016).

### 3. Results and Discussion

Participants' preference data were used in the conjoint analysis and after submitted to ANOVA test. The ANOVA results for each participant excluded 5 consumers from the subsequent analysis who did not fit the model ( $p > 0.10$ ). Data from the relative importance were submitted to hierarchical groups analysis. To identify significant differences among the groups, each groups' demographics were submitted to statistical tests. Chi-square test to k proportion with Marascuilo procedure ( $\alpha = 0.05$ ) were used to identify significant differences in the frequency distributions for age, gender, education, income and origin state (province). The results are shown in Table 2.

**Table 2.** Demographic distribution of the three identified clusters.

Demographic distribution	Frequency (%)				$\chi^2$	p-value
	General (n=395)	Cluster 1 (n=171)	Cluster 2 (n=138)	Cluster 3 (n=86)		
<b>Age</b>						
<33	37.7	35.7a	31.2a	52.3b	10.643	0.005
33-55	53.9	58.5b	58.0b	38.4a	10.710	0.005
>55	8.4	5.8a	10.9a	9.3a	2.644	0.267
<b>Gender</b>						
Females	55.2	53.8a	57.3a	54.65a	0.379	0.827
Males	44.8	46.2a	42.8a	45.35a	0.379	0.827
<b>Education</b>						
Primary	17.0	13.5a	18.8a	20.9a	2.804	0.246
Secondary	53.9	53.8a	51.4a	58.1a	0.956	0.620
University	29.1	32.7a	29.7a	20.9a	3.909	0.142
<b>Income (number of minimal Brazilian wages*)</b>						
<5	66.8	56.1a	76.8b	72.1b	16.093	0.000
5-8	29.9	38.0b	22.5a	25.6a	9.779	0.008
>8	3.3	5.8b	0.7a	2.3a	6.620	0.037
<b>Province (State)</b>						
MT	50.4	60.2b	43.5a	41.9a	11.769	0.003
GO	49.6	39.7b	56.5a	58.1a	11.769	0.003

Values with different letters within the same row are significantly different ( $p \leq 0.05$ ) according to chi-square test to K proportions with Marascuilo procedure; \*1 minimal Brazilian wages is equal to R\$1.100,00 or US\$200,00, in year of 2021 (US\$1,00 = R\$5,50).  
Source: The authors themselves.

As shown in Table 2, in general the participants are composed by people with an age between 33 to 55 years (53.4%), divided in 55.2% of female and 44.8% of male, with secondary education (53.9%) and income of until 5 minimal Brazilian wages. This study showed a slightly higher concentration of women, which corroborates the findings of Ares et al. (2010), Gadioli et al. (2013), Lima Filho et al. (2015) and Romano et al. (2015).

In relation to the groups, significant differences were found in the ages, income and province. On the other hand, no differences were found between gender and education. In this sense, Group 1 (171 consumers, 43%) is composed predominantly by people from Mato Grosso with an age between 33 to 55 years (58.5%). Group 2, formed by 138 consumers (35%), is composed predominantly by people of from Goiás, and equally Group 1, with intermediary age. On the other hand, the consumers in Group 3 (86 consumers, 22%) are formed by younger people aged up to 33 years old (52.3%), from Goiás and as the Group 2, with less income, of until 5 minimal Brazilian wages.

After group analysis, the relative importance and the part-worth utilities of each group were evaluated using kruskal-Wallis test for identifying significant differences. Table 3 shows the part-worth of each attribute level and their relative importance to soybean oil package.

**Table 3.** Part-worth utilities and relative importance of each attribute for each of the four clusters identified.

Attributes	General (n=395)	Cluster 1 (n=171)	Cluster 2 (n=138)	Cluster 3 (n=86)
<b>Brand</b>				
Popular	0.423	0.379b	0.520b	0.355b
Unpopular	-0.423	-0.379a	-0.520a	-0.355a
Relative importance (%)	18.15	13.13B	26.81BC	14.24B
<b>Type of soybean</b>				
Non-GM	0.030	-0.080a	0.188b	-0.006a
GM	-0.030	0.080b	-0.188a	0.006a
Relative importance (%)	12.88	3.36A	22.20AB	10.88A
<b>Additional information on the packaging</b>				
Yes	1.130	1.667b	0.750b	0.672b
No	-1.130	-1.667a	-0.750a	-0.672a
Relative importance (%)	41.49	57.59D	31.06C	26.22C
<b>Shape of the packaging</b>				
Innovative	0.604	0.613b	0.361b	0.970b
Conventional	-0.604	-0.613a	-0.361a	-0.970a
Relative importance (%)	27.48	22.92C	19.94A	48.66D
Constant value	5.366	5.076	5.458	5.794

Part-worth utilities (with small letters) and relative importance (with capital letters) with different letters within the same column for the same attribute and cluster are significantly different ( $p \leq 0.05$ ) according to Kruskal-Wallis multiple comparisons test; Negative signals mean negative impact on consumer preferences. Source: The authors themselves.

As shown in Table 3, in general, the attribute with higher relative importance is the additional information on the packaging (IR=41.49%) showing that participants had higher expected preference to this attribute. This result suggests that those participants may have a greater appreciation for either information about product features. The next attributes were the shape of the packaging (IR=27.48%), the brand (IR=18.15%) and type of soybean (IR=12.88%). Furthermore, the participants were influenced positively by the presence of additional information, innovative package, popular brand and non-genetically modified soybean. Queiroz et al. (2016), analyzing soybean oil packages in Mato Grosso, identified similar results, except for the perception of the type of soybean, in which consumers do not care about GM soybeans.

Similar to the present study, the research by Carneiro et al. (2012) about the factors of the packaging and label of cachaça in the consumers behavior verified that the additional information positively influenced the consumers of Viçosa-MG, enriching the contents of the packaging. Oenning et al. (2017) found similar results about the presence of additional information and an innovative shape on the processed tomato packaging.

Group 1, consisting predominantly by people with intermediate age from Mato Grosso, attributed higher relative importance to additional information on the packaging (IR=57.69%) and lower RI to type of soybean (IR=3.36%). In this group, the participants surprisingly prefer genetically modified soybeans, as we can see that there was negative impact to non-genetically modified soybean as a negative sign of the part-worth's utilities in Table 3. This could suggest that the participants do not understand the meaning of the symbol on the label of packaging or do not care about genetically modified soybeans.

On the other hand, Group 2 predominantly formed by people from Goiás, with intermediate age, rejected genetically modified soybeans. Despite of positive impact to innovative package, this group is highlighted by to show lower relative importance to packaging shape, thus showing a traditional behavior of purchase. Therefore, we denominated this segment as traditional consumers of Goiás.

Group 3, inversely to Group 2, is highlighted by to show higher relative importance to packaging shape, thus showing an innovative behavior of purchase. This segment was consequently labeled as innovative consumers of Goiás. This behavior could be explained by the low age of the participants that differs from Group 2. Moreover, this group was not significantly different regarding to the part-worth of the soybean attribute type, in this sense, equally to Group 1, the participants do not understand or do not care about genetically modified soybeans. The study by Dantas et al. (2011) about the packaging and



labeling of guava jelly demonstrates the importance of the format and type of packaging as decisive in the purchase choice of the product.

In relation to the soybean type, the results showed that there is a clear controversy (disagreement) between (among) the groups. Apparently consumers from Mato Grosso and younger consumers from Goiás do not care about GM soybean, or do not understand it. While the older consumers from Goiás clearly identifies the symbol of GM soybean in package label.

Queiroz et al. (2016), analyzing soybean oil packages in Mato Grosso, identified that consumers do not care about GM soybean. However, Carneiro et al. (2005) identified four groups of consumers in Viçosa (MG) with different preferences about GM soybean. Three of four groups showed sharp rejection to genetically modified soybean, however, these authors have not highlighted distinct demographic profiles between the groups, likewise this study. A similar result was obtained in the study by Schnettler et al. (2012), where three groups of consumers were identified in Talca and Temuco in Chile with different preferences regarding to milk and genetically modified tomato sauce, in which two groups showed rejection to transgenic foods, demonstrating the negative effect of this information on food packaging. These results are very important in Brazilian national scenario, because in recent years there has been a great debate about the obligation of this information on food labels.

In all the analyzed groups, the familiar or popular brands had a positive impact on consumer preference (i.e., a positive sign in the corresponding part-worth utilities) and showed intermediate relative importance to most groups. Therefore, as a recommendation for companies to develop marketing strategies, it would be interesting to publicize their brands to become more familiar to consumers. Symbols can be created to attract the attention of consumers and thus, highlights them before the other brands. These results are similar to those presented by Carneiro et al. (2005) who assessed two soybean oil brand in Brazil; and Ares et al. (2010) which assessed consumer preference for milk desserts in respect to Argentinean and Uruguayan brands in Uruguay.

The additional information on the package showed higher relative importance to Group 1 and Group 2, and the second highest to Group 3, and its presence presents a positive impact on consumer preference for all of the analyzed groups. Groups 1 and 2 are formed predominantly by people with intermediate age, indicating (or suggesting) that older consumers may have a greater appreciation for either information about product features than younger consumers.

In general, these results are supported by Carneiro et al. (2005), Gadioli et al. (2013), Romano et al. (2015) Oenning et al. (2017) who assessed the presence of packaging information of various food products, however, the results contrasts with the studies of Lima Filho et al. (2015) who assessed the influence of the irradiated strawberries packaging explanatory information. Nevertheless, these authors are unable to determine a statistically distinct demographic profiles, likewise this study. The study by Dossin et al (2019), on the other hand, points out that additional designation of origin information positively affects Brazilian and French coffee consumers, with distinct profiles, corroborating the results found.

Muratore and Zarbà (2011), consider which devices that facilitate product use can influence consumers in evaluating a product. Ares and Deliza (2010) pointed out that the packaging shape significantly affected the intention of buying milk desserts. In this study the packaging shape showed to be statistically higher in terms of relative importance to Group 3, the second highest to Group 1 and lower to Group 2. The innovative consumers from Goiás (Group 3) are predominantly younger people, and the traditional consumers from Goiás (Group 2) are consumers with intermediate age, suggesting that age have an impact on purchase intent to innovative or conventional products. In this sense, the innovative packaging shape is shown as a great opportunity to companies to develop a design of functional package that facilitates the use of the product.

These results are supported by several authors. Giancrisofaro and Bordignon (2016) find similar results in which consumers appreciate easy-use devices, for example, reclosable bags. Again, the authors have not highlighted distinct demographic profiles. Oenning et al. (2017), who assessed the processed tomato packaging in Brazil, find the presence of

devices that facilitate opening a package had a positive impact on consumer preferences. Carneiro et al. (2019) identified a greater preference for drugs packaging that presents traces of modernity.

#### 4. Conclusion

With this research, we were able to highlight three distinct profiles of soybean oil consumers in the Midwest region of Brazil. The younger consumers living in Goiás (Group 3), prefer more innovative products that facilitate its handling and the additional information on the package label, and showed less importance to genetically modified products, showing a consumption profile very similar to Group 1 that are formed by consumers from Mato Grosso. Both groups, surprisingly, show positive impact to transgenic soybeans, which leads us to believe that these consumers do not understand or do not care about genetically modified products.

The consumers living in Goiás with intermediate age (Group 2) were less swayed for innovative packaging shape showing a traditional purchase behavior, but they had a higher preference for packaging information and to best-known brands. Moreover, they showed distaste for genetically modified products.

With the exception of traditional consumers from Goiás, the innovative shape has been well accepted for this product. Furthermore, all profiles of consumers showed high preference expected to information on the label of packaging. In this sense, marketing strategies for food companies that produce soybean oil could be directed to design innovative packaging, with label additional information and highlight their brand.

In this way, the present study can help in the strategies of differentiation and value aggregation to agroindustrial products, given the competitiveness of today market, boosting the agribusiness economy and administration. However, it is important to note that different marketing strategies must be aimed at different consumer profiles.

Additionally, we believe that this study can help food companies develop new technologies to differentiate and innovate packaging.

Further studies are recommended to evaluate if consumers have difficulties to interpret the symbols on the packaging label (transgenic, organic or irradiated products, for example), as well as are necessary to extend this survey to other Brazilian states, thus expanding the marketing research in the food industry and improving the management and economy of this sector.

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