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What factors influence parents' decisions to buy products for their children? An ideal packaging proposal for mini cakes enriched with sweet potato flour

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Abstract

The aim of this study was to develop ideal packaging for mini cakes enriched with sweet potato flour and filled with blackberry jam. The research was conducted in two stages. In the first stage, the focus group method was used with 19 parents, divided into three subgroups based on their children's ages: 6–9, 10–12, and 13–17 years. The interviews, conducted via Google Meet, were moderated by a researcher who followed a script of questions, with all sessions recorded with participants' consent. Based on the collected data, eight different packaging designs were created, varying in color (purple and beige), the inclusion of games (puzzles and mobile app), and additional messages ("Satiety and energy!" and "Nutritious and tasty!"). In the second stage, 48 questionnaires were developed, each presenting the packages in different orders, and these were administered to 144 consumers. The data, analyzed using choice-based conjoint analysis, suggested that the ideal packaging for the mini cakes is purple, features puzzle imagery, and includes the message "Nutritious and tasty!"

Keywords: choice-based conjoint analysis; sensory analysis; focus group; purchase intention.

Practical Application: Research on the influence of packaging on the purchase of food products can help companies' marketing.

1 INTRODUCTION

Currently, the eating behavior of children and adolescents is influenced by technological advancements, as well as the preferences and eating practices of parents and friends. These consumer groups are of great importance in the market due to the wide variety of products available. To generate significant profits for food companies, various marketing techniques are employed to directly influence family purchases or encourage independent consumption by children (Rocha et al., 2021; Sousa, 2018).

Consumer habits are acquired in childhood, with parents serving as the first nutritional guides responsible for establishing healthy eating habits (Sousa, 2018). Recognizing this, the media has developed strategies to increase the consumption of food products, such as airing commercials on television, modifying packaging designs (including color, shape, and product information), and incorporating cartoon characters. These visual aspects significantly impact children's preferences, as they are often persuaded by the appearance of the packaging, given their developing reading skills and limited letter or word recognition (Angka et al., 2020; Sousa, 2018). These attributes directly influence purchase intentions (Della Lucia et al., 2010), with parents frequently swayed by their children's preferences.

To better understand the factors influencing consumer purchasing decisions and their importance in packaging development, we employed choice-based conjoint analysis (CBCA). This method presents a set of packages (treatments) to the consumer and asks them to choose their preferred option based on the packaging information (Della Lucia et al., 2010).

Santos et al. (2019a, 2019b) developed mini cakes enriched with sweet potato flour and filled with blackberry jam, evaluating their sensory and nutritional characteristics. The authors found that these cakes had a higher mineral content (ash) than the control cakes (without sweet potato flour) and achieved a 91.11% acceptance rate, indicating strong market potential.

Thus, the purpose of this study was to develop ideal packaging for these sweet potato flour-enriched cakes using the focus group technique and applying CBCA to different packaging options.

2 MATERIALS AND METHODS

This research was divided into two stages: a focus group (FG) and CBCA. For both stages, participants provided informed consent according to the Research Ethics Committee of the Universidade Federal de Minas Gerais (CAAE: 97454718.1.0000.5149).

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In the first stage, 19 parents of children and adolescents aged 6–16 years participated voluntarily. Participants were invited via email, based on a prior survey conducted by the researchers and their availability to participate in the FG meetings. They were divided into three distinct age segments: segment 1 (S1), responsible for children aged 6–9 years; segment 2 (S2), responsible for children aged 10–12 years; and segment 3 (S3), responsible for adolescents aged 13–17 years. The FG methodology was adopted following the procedure outlined by Della Lucia and Minim (2018).

Three FG sessions were conducted remotely between April 13 and 16, 2024, via the Google Meet platform. The sessions were divided according to the segments, with six participants in S1, seven in S2, and six in S3. Each session lasted approximately one and a half hours.

The sessions were facilitated by a moderator, with at least two other researchers present to record audio and take notes. Before starting, the moderator explained the purpose of the meeting and requested consent for video recording, following a question script and encouraging participants to freely express their opinions.

Afterward, the research team held meetings to review, listen to, and transcribe the recordings. For data analysis, attention was given to the frequency of responses and the comparison of similar, unique, or differing responses, reaching a consensus where excerpts from participants' responses were selected for the presentation of results.

The data collected in the FG were used to develop packaging designed to attract consumers and influence purchasing decisions. The packaging was created by the authors using Adobe Dimension (Adobe, 2024a) and Adobe Illustrator (Adobe, 2024b).

Based on the developed packages, questionnaires were created and distributed via Google Forms. The CBCA was applied following the procedures described by Della Lucia et al. (2010). The factors studied included package color, presence of games, and additional information. Two levels were defined for each factor, and the complete profile method was used for data collection (Green & Srinivasan, 1978), applying a full factorial design (Carneiro et al., 2018) to consider all possible combinations of the factor levels (Table 1).

To minimize the effects of presentation order and the residual influence of one treatment on the evaluation of the subsequent one, the order of the packaging images (treatments) in the questionnaires followed the experimental design proposed by Macfie et al. (1989). As a result, 48 questionnaires were created, each presenting different possible orders of the treatments. Each questionnaire was distributed to and answered by three consumers, resulting in 144 participants in this stage of the research.

Table 1. Factors and levels of treatments under study.

Treatment	Color	Games	Additional information
1	Purple	Puzzle	Satiety and energy!
2	Purple	Puzzle	Nutritious and tasty!
3	Purple	Mobile app	Satiety and energy!
4	Purple	Mobile app	Nutritious and tasty!
5	Beige	Puzzle	Satiety and energy!
6	Beige	Puzzle	Nutritious and tasty!
7	Beige	Mobile app	Satiety and energy!
8	Beige	Mobile app	Nutritious and tasty!

The consumers answered about socioeconomic issues, about the consumption of products with sweet potatoes, and chose only one package among those presented in the study. Thus, the treatment (packaging image) chosen by each consumer was coded as 1 and the other treatments as 0. Factor levels (color, games, and additional information) were also coded (Table 2).

The estimate of the probability of choice of treatments was calculated using the model proposed by McFadden (1974), called multinomial logit (Equation 1), given by:

$$Pj = \frac{e^{Xj\beta}}{\sum_{i}^{n} e^{Xi\beta}} \quad (1)$$

Where:

n: the number of factors;

X: the matrix with coded values associated to the j^{th} treatment and the i^{th} factor level;

β: the vector of parameters estimated through iterative numerical methods, in order to maximize the verisimilitude function (L) of the sample or, similarly, the logarithm of the L function (Sant'anna, 2020).

The effect on the odds probability of choosing a treatment j based on the level of one factor over the other level of the same factor (value *hazard ratio*), was also calculated (Equation 2), following the description of Sant'Anna (2020):

$$Hazardration_n = \frac{P(level2)}{P(level1)} = e^{\beta_n (X_{level2} - X_{level1})} \quad (2)$$

Where:

β: the vector of estimated parameters,

n: number of factors,

X_{level2}: 1,

X_{level1}: 0, according to the coding given to the levels of the factors under study (Table 2).

Table 2. Coding of packaging factor levels.

Factor	Level	Codification
Color	1—Purple	0
	2—Beige	1
Games	1—Puzzle	0
	2—Mobile app	1
Additional information	1—Satiety and energy!	0
	2—Nutritious and tasty!	1

All statistical analyses were performed using the software R Core Team (2024).

3 RESULTS

In total, 19 parents of children and adolescents between 6 and 16 years old, who participated in the FG, were segmented into groups based on their children's ages, through a questionnaire previously sent to the invited participants.

Segments 1, 2, and 3 consisted of six women, four women and two men, and five women and one man, respectively. With regard to professional performance in the area of health or food, such as nursing technicians, pharmacists, teachers, and the like, in segments 1 (S1), 2 (S2), and 3 (S3), three, four, and one person participated in the research, respectively. The others were professionals from other areas such as law, administration, and library science, among others.

The first question directed at the participants was about what they usually observe in the packaging of food products, and for all segments, most mentioned a nutritional table, list of ingredients, and expiration date. The S2, with parents of children aged 10–12 years, stood out by mentioning the taste of the product, which was unexpected, since the group had a greater number of people from the health and food area. Only two of the interviewees mentioned observing nutritional claims such as the amount of salt and sugar, for example.

Regarding the importance of the appearance of the food product packaging at the time of purchase, all answered that it is very important, except for two participants from segment S2 who answered no.

The participants were asked about the type of material that the packaging is made, whether this influences their decision to buy a food product, and what type of packaging for food products they prefer. All answered yes and mentioned that they prefer recyclable (sustainable), reusable, and practical packaging, with some opting for more than one type. However, some of them were not concerned about the type of packaging and sustainability issues.

During the interviews, consumers were asked whether the presence of games on packaging or the invitation to access games influenced their choice when purchasing a children's product. A little more than half of the interviewees answered yes. However, almost unanimously, they stated that they avoid buying products with invitations to access games on the internet, opting for educational games contained in the packaging itself.

Most of the interviewees' children do not have the habit of consuming sweet potatoes. Parents reported that, although they try to convince their children to eat this kind of potato, resistance is great. Therefore, they were asked if they were aware of the benefits of this tuber. Most knew it had some benefit, but the information was very vague.

When asking respondents about buying a product (mini cake) enriched with sweet potato flour, they all replied that they would buy it for their children. And they suggested some colors for these products; in some cases, they answered more than one color, making it difficult to conclude which colors would be most appreciated. In addition, the interviewees stated, almost entirely, that the use of additional information (phrases) on the packaging would attract them and so, influence them to buy this food product.

The participants were asked to think of the first three words that would convince them to buy a mini cake enriched with sweet potato flour. It is observed that the set of quoted phrases referred to questions of satiety, nutrition, and energy. These and other information collected in the FG, such as the importance of flavor in choosing a product, were used to elaborate additional information on an ideal packaging.

Subsequently, they were asked whether the additional phrase "More vitamins and minerals" on the packaging of that product would entice them to buy it. Most said yes, but some consumers expressed their concerns about this information.

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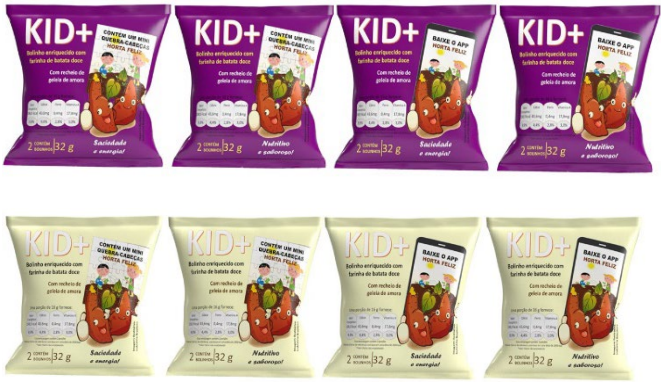
When they were asked if the additional "Nutritious" or "Healthy food" would make them feel more intentioned to acquire the product, most of the interviewees said yes, only three consumers suggested other information.

The second stage of this study was the application of the questionnaire created from the information collected in the FG, using the eight packages (treatments) in accordance with the information previously presented (Table 1). The images of the packages prepared for the eight treatments are shown in Figure 1.

The value "-2 log L," where "L" is the likelihood function, was calculated with the respective estimates of the β parameters; this calculation was performed from the reduced model, where one of the factors is excluded from the analysis, obtaining three values for "-2 log L," one each time a factor was reduced in the



Packaging information: (1) Product brand: KID+; (2) Product information: Mini cake enriched with sweet potato flour. Filled with blackberry jam; (3) Game information: "Contains a mini-puzzle Happy Garden" and "Download the Happy Garden app"; (4) Nutritional information: Energy value: 198.9 kcal (9.9%), Calcium: 43.6 mg (4.4%), Iron: 0.4 mg (2.8%), Vitamin A: 17.8 mg (3.0%); Serving information: Contains two mini cakes (32 g). Additional information: "Satiating and Energizing" and "Nutritious and Delicious."

Figure 1. Packaging proposals for mini cakes enriched with sweet potato flour.

analysis (color, games, and additional information), allowing the significance of each factor for the quality of the model's fit, which "could be evaluated by test of the likelihood ratio of each model reduced by the complete model" (Della Lucia et al., 2010). Table 3 shows the summary of the analyses for the full model and the three reduced models.

It was observed that only the "color" factor significantly affected the variability of choices according to the model adopted, which means that only this factor significantly influenced the consumers' assessment. The estimates of the β coefficients and the hazard ratio (HR) values are shown in Table 4.

The probability of choice for each treatment (eight different packages), calculated from Equation 1, is shown in Table 5.

4 DISCUSSION

As discussed in the FG, when asked what they observe in food packaging, for all segments, most parents responded with a nutritional table, list of ingredients, expiration date, and some cited nutritional claims. According to Chandon and Wansink (2012), packaging can be an excellent tool to influence healthy habits, that is, the information contained in packaging and its design can positively influence consumers to have a better quality of life due to a more balanced diet.

However, when asked about the first thing they observe in the package, most in segment S1 mentioned the product description and the color of the package, while in segments S2 and S3 they mentioned the expiration date.

Table 3. Summary of likelihood ratio test results.

Model type	Value "-2 log (L)"	Chi-square test
Reduced without the "color" factor	-21.717	21.374**
Reduced without the "games" factor	-42.974	0.117ns
Reduced without the "additional information" factor	-41.680	1.410ns

**Significant by the likelihood ratio test; ns: not significant ($p > 0.01$).

Table 4. Summary of the estimation analysis of the model coefficients by maximum likelihood and *hazard ratio.*

Variable	β coefficient estimate	*Hazard ratio* value
Color	-1.051**	2.860
Games	-0.029ns	0.972
Additional information	0.104ns	0.901

**Significant by the likelihood ratio test at the 1% level; ns: not significant ($p > 0.01$).

Table 5. Probabilities estimated by the joint analysis of factors based on choices for the eight treatments.

Treatment	Probabilities	Treatment	Probabilities
1	0.1781	5	0.0623
2	0.1976	6	0.0691
3	0.1731	7	0.0605
4	0.1921	8	0.0671

According to Battistella et al. (2010), "the product cannot be planned separately from the packaging, which, in turn, should not be defined only based on engineering, marketing, communication, legislation and economics." For the authors, the colors of the packages have several effects, being a form of communication capable of provoking feelings in the consumer.

In relation to the nutritional table, almost entirely, the interviewees informed that they have the habit of consulting it. However, only half actually know how to interpret the information. In a study carried out by Frugerio and Kaetsu (2016), 50% of respondents observe the nutritional information on packaging, demonstrating consumers' concern about what they are eating and about their health.

Regarding the characteristics of the packaging in the decision to purchase food products, two participants in the S2 segment answered no. According to these participants, they are looking for traditional products, which they buy for their children.

In a similar study carried out by Frugerio and Kaetsu (2016), one of the interviewees stated that he remembers "the Isabela brand milk biscuit because he always consumed it." For the authors, this fact is characteristic of a cultural influence, in which a group shares values and behaviors. Thus, these authors claim that consumers, "in addition to looking for products that meet their needs, they want products or brands that share similar values to theirs, that are part of their lives."

It was observed in this study that, although most demonstrate concern with sustainability issues, the use of packaging that can be reused, regardless of the material they are made, is more attractive to consumers.

For Landim et al. (2016), there is a concern about the final destination of packaging and the impacts it can have on the environment. Thus, the development of sustainable packaging has increased, and industries, especially food, should seek to develop packaging using as little material as possible. In addition to this, the population must be encouraged, through public policies, in order to reduce consumption and inadequate disposal of packaging.

Regarding the color of the packaging, about 60% of interviewees said that they do not feel influenced in the purchase decision and that they have never bought a product influenced by the packaging color. Battistella et al. (2010) stated that the colors of a package "stimulate and direct the type of public the product is intended for" and that this has a great influence on people's lives. But, according to the authors, you do not buy something just for the color, this is not a product.

Although most of the interviewees' children are not used to consuming sweet potatoes, all the parents of the FG showed interest in buying the mini cake enriched with sweet potato flour.

The sweet potato (*Ipomoea batatas* (L.) Lam) is an energy food, with approximately 30% of dry matter, which has an average of 85% of carbohydrates, with starch as the main constituent (Ferreira & Rezende, 2019). The use of sweet potato in food is also beneficial due to its low glycemic index, which results in a reduction in the feeling of hunger and an increase in satiety, and thus, it contributes to weight control (Low et al., 2007).

According to Spink et al. (2011), the packaging influences the consumer's purchase decision, and the information can be misinterpreted, motivating the consumer not to buy the product. This behavior was observed in the present study, because, although some consumers have positively assimilated the additional information "More vitamins and minerals," some of them were "suspicious" of the information, which possibly led to the decision not to buy the product.

Regarding the estimated odds ratio, HR value, according to the coded levels, it is observed that for the color factor: HR = 2.860, the probability of choosing the purple packaging was 2.86 times greater than choosing the one with the beige color, since the estimate of the β coefficient was negative, with a tendency, therefore, to the coded level 0 (Table 2). For the game factors (HR = 0.972) and additional information (HR = 0.901), the estimates of the β coefficients were not significant, that is, these factors did not interfere with the choice of packaging.

From these results, it was observed that the color has a greater tendency to exert a greater positive impact on consumers during their choice of product, in relation to the other levels of factors studied (games and additional information).

According to Battistella et al. (2010), "when the issue is quality, dark colors convey tasty, rich and substantial dishes, while white and light colors convey the idea of fresh, light or dietary foods." Also, according to the same authors, "strong colors can make the packaging much more visible than muted colors." Therefore, it is suggested that the choice of purple color prevailed in the proposed packaging, both because it represents a tastier product and because it is a stronger, more striking color.

It is observed from the results obtained by the CBCA, that treatment 2 had the highest estimated probability of being chosen by consumers (p = 0.1976), followed by treatment 4 (p = 0.1921). Although the additional phrase factor did not interfere with the choice, according to the estimation analysis of the model coefficients by maximum likelihood and HR, it is observed in both treatment 2 and treatment 4 that the additional phrase was the same ("Nutritious and tasty!").

Therefore, from these results, treatment 2 is suggested as the ideal packaging for the mini cake enriched with sweet potato flour, that is, a purple packaging, with the puzzle game and the additional information "Nutritious and tasty!"

5 CONCLUSION

It was possible to conclude that the color of the packaging is a factor that positively influences the decision to purchase products such as mini cakes enriched with sweet potato flour. Moreover, a purple-colored packaging, with the puzzle game and the additional information "Nutritious and tasty!" is more attractive to parents of children and adolescents between 6 and 16 years old when deciding to buy this product for their children.

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REFERENCES

Adobe (2024a). *Adobe Dimension* (Version 3.4.2). Microsoft Corporation. Retrieved from https://www.adobe.com/br/products/dimension.html

Adobe (2024b). *Adobe Illustrator* (Version 25.2.3). Microsoft Corporation. Retrieved from https://www.adobe.com/br/products/illustrator.html

Angka, S., Hémar-Nicolas, V., Hapsari, H. P., & Olsen, A. (2020). How packaging colours and claims influence children's vegetable attitude and intake–An exploratory cross-cultural comparison between Indonesia and Denmark. *Food Quality and Preference*, *79*, 103795. https://doi.org/10.1016/j.foodqual.2019.103795

Battistella, N., Colombo, J. R., & Abreu, K. C. K. (2010). A importância da cor nas embalagens como fator influenciador no momento da compra. In: Rodrigues, C. (Ed.), *Biblioteca online de ciências da comunicação* (pp. 1-20). LABCOM. Retrieved from http://www.bocc.ubi.pt/pag/bocc-kraemer-embalagens.pdf

Carneiro, J. D. S., Silva, C. H. O., Della Lucia, S. M., & Minim, V. P. R (2018). Análise conjunta de fatores. In: Minim. V. P. R. (Ed.), *Análise sensorial: estudos com consumidores* (4th ed., pp. 191-242). Editora UFV.

Chandon, P., & Wansink, B. (2012). Does food marketing need to make us fat? A review and solutions. *Nutrition Reviews*, *70*(10), 571-593. https://doi.org/10.1111/j.1753-4887.2012.00518.x

Della Lucia, S. M., & Minim, V. P. R. (2018). Grupo de foco. In: Minim, V. P. R. (Ed.), *Análise sensorial: estudos com consumidores* (4th ed., pp. 86-111). Viçosa: Editora UFV.

Della Lucia, S. M., Minim, V. P. R., Silva, C. H. O., Minim, L. A., & Silva, R. C. S. N. (2010). Análise conjunta de fatores baseada em escolhas no estudo da embalagem de iogurte light sabor morango. *Brazilian Journal of Food Technology*, *6*, 11-18.

Ferreira, J. C., & Rezende, G. M. (2019). Batata-doce: Cultivar adequada faz toda diferença. *Campo & Negócios*, *14*(172), 24-25.

Frugerio, G., & Kaetsu, S. T. (2016). Análise de embalagens de produtos alimentícios que marcaram a lembrança dos consumidores. *Caderno de Administração*, *23*(2), 92-105. Retrieved from https://periodicos.uem.br/ojs/index.php/CadAdm/article/view/30850

Green, P. E., & Srinivasan, V. (1978). Conjoint analysis in consumer research: issues and outlook. *Journal of Consumer Research*, *5*(2), 103-123. https://doi.org/10.1086/208721

Landim, A. P. M., Bernardo, C. O., Martins, I. B. A., Francisco, M. R., Santos, M. B., & Melo, N. R. (2016). Sustainability concerning food packaging in Brazil. *Polímeros*, 26, 82-92. https://doi.org/10.1590/0104-1428.1897

Low, J. W., Arimond, M., Osman, N., Cunguara, B., Zano, F., & Tschirley, D. (2007). A food-based approach introducing orange-fleshed sweet potatoes increased Vitamin A intake and serum retinol concentrations in young children in rural Mozambique. *Journal of Nutrition*, *137*(5), 1320-1327. https://doi.org/10.1093/jn/137.5.1320

Macfie, H. J., Bratchell, N., Greenhoff, K., & Vallis, L. V. (1989). Designs to balance the effect of order of presentation and first-order carry-over effects in hall tests. *Journal of Sensory Studies*, *4*(2), 129-148. https://doi.org/10.1111/j.1745-459X.1989.tb00463.x

McFadden, D. (1974). Conditional logit analysis of qualitative choice behavior. In: Zarembka, P. (Ed.), *Frontiers in Econometrics* (pp. 105-142). Academic Press.

R Core Team (2024). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Retrieved from https://www.R-project.org/

Rocha, C., Ribeiro, J. C., Lima, R. C., Prista, C., Raymundo, A., Patto, M. C. V., & Cunha, L. M. (2021). Application of the CATA methodology with children: Qualitative approach on ballot development and product characterization of innovative products. *Food Quality and Preference*, *88*(3), 104083. https://doi.org/10.1016/j.foodqual.2020.104083

Sant'anna, L. J. (2020). *Impacto da embalagem nos valores dos limiares hedônicos para redução de cloreto de sódio em biscoito salgado* [Dissertação de Mestrado, Universidade Federal do Espírito Santo].

Santos, A. F. C., Fonseca, M. L. D., Silva, C. B., da Silva, K. S., Oliveira, M. L. P., & Vieira, C. R. (2019a). Análise sensorial de minibolos formulados com farinha de batata doce recheados com geleia de amora. In: Vieira, C. R. et al. (Eds.), *III Simpósio de Engenharia de Alimentos - SIMEALI: interdisciplinaridade e inovação na Engenharia de Alimentos* (v. 2, pp. 399-404). ICA–UFMG. Retrieved from https://https://www.simeali.com/publicacoes

Santos, A. F. C., Silva, C. B., Barbosa, R. P. de A., Costa, A. F. D., Oliveira, M. L. P., & Vieira, C. R. (2019b). Avaliação da composição química nutricional e tecnológica de bolos elaborados com farinha de batata doce. In: Vieira, C. R. et al. (Eds.), *III Simpósio de Engenharia de Alimentos - SIMEALI: interdisciplinaridade e inovação na Engenharia de Alimentos* (pp. 375-382). ICA–UFMG. Retrieved from https://www.simeali.com/publicacoes

Sousa, N. F. (2018). *A influência da mídia no padrão alimentar infantil* [Trabalho de Conclusão de Curso, Centro Universitário de Brasília].

Spink, J., Singh, J., & Singh, S. P. (2011). Review of package warning labels and their effect on consumer behaviour with insights to future anticounterfeit strategy of label and communication systems. *Packaging Technology and Science*, *24*(8), 469-484. https://doi.org/10.1002/pts.947