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Research Article

Evaluation of consumer preference in packaging of energy drinks

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Abstract

Understanding consumer attitudes towards food remains critically important for manufacturers, retailers and governing bodies. Age groups have variation in liking food items in the market. The aim this study is to determine if there is an underlying connection with consumer preference on energy drinks as influenced by the type of its packaging. Target consumers for this study are college students between 17-21 years old. Energy drinks in plastic bottles, tin cans and glass bottles were used. The consumers were asked to determine consumer response on packaging quality, packaging preference on energy drink and factors affecting budget competence. The overall preferred packaging of energy drinks by consumers is tin can. Quality factors such as convenience to carry and sensory perceptions can affect the packaging preference of the consumer. The consumers are more inclined to spend based on quantity and quality suitable for their budgetary requirement.

Keywords: beverage, plastic, cans, glass, sensory analysis, Philippines.

Introduction

Packaging, aside from containing the product and protecting its contents during storage and shipping, serves another purpose; to be used as a marketing tool. Industries are continuously finding out ways to innovate and improve their packaging design to enhance its external features and capture the attention of potential buyers. Constantly, packaging designs are evolving through the use of different graphic properties (e.g. labeling, colour, figures), as well as changing its structural properties such as the type of packaging material to be used [1]. Making products more appealing to influence consumers in buying the product proves a great challenge for advertisers of manufacturing companies. Using the product to catch consumer attention is an effective strategy as this will provide industries with a competitive advantage against their competitors in the market. In this case, the predominant sense used is sight; hence, packaging is an important element in the decision to purchase a product. The packaging must be able to convey what the product is all about. Its label must inform

and develop an expectation of the product's purpose, characteristics and experiences during consumption [2]. As per the study of Puyares *et.al* [3], it was observed that a consumer's expectation with regard to the type of wine is influenced by the shape and colour of the bottle. An earlier study by Deliza *et.al* [4] showed that added information on the label regarding the use of technology and its benefits exhibited higher intent for consumers to purchase the product.

Energy drinks are marketed as an energy booster that provide increased alertness and endurance, as well as decreased feelings of fatigue when consumed [5]. They are advertised as a convenient beverage that is readily consumable any time of the day. People who regularly consume energy drinks usually perform physically demanding or mind-numbing activities. These people commonly are students, workers such as call centre agents and drivers.

The core ingredient of an energy drink is caffeine. Caffeine, is a central nervous system stimulant which can be naturally obtained from coffee beans, cola nuts, guarana, tea, cocoa beans and cassina [6]. This is responsible for the consumers' increased sense of alertness and focus, with a decreased feeling of mental fatigue [7]. Other ingredients of energy drinks include glucose, wherein together with caffeine, increases verbal working memory and improves sustained attention but reduces reaction time [8]. Meanwhile, B-complex vitamins break down food to form energy as well as decreasing fatigue. Taurine improves choice response time but reduced psychomotor performance and regulates caffeine's locomotor-increasing effects [8] and other additives that contribute to the boosting properties of energy drinks.

The chosen proponents (N=75) were college students who regularly consume energy drinks. The aim of this research is to determine if there is an underlying connection with consumer preference on energy drinks as influenced by the type of packaging. This study also evaluates the perception of consumers when it comes to the intrinsic properties of energy drinks through taste, smell, appearance and carbonation when different packaging materials are used.

Methodology

Sensory evaluation of three different brands of energy drinks in different packaging materials (glass, tin can, PET) was done by seventy-five (75) panelists (37=female; 38=male) with the age range of 15-21 years. Panelists identified which among the packaging materials they prefered and what factors such as quality, sensory perception and cost considerations affected their preference using a 5-point scale (5 = strongly agree; 1 = strongly disagree).

Statistical analysis used to interpret data is Basker's Table for Packaging Preference, Effects of Quality and Budgetary Requirements. For the effects of sensory attributes, analysis of variance was used to determine the significant difference among the packaging materials. All statistical analyses used $p<0.05$ level of significance.

Results and Discussion

Of the choices offered, 62.67% of the 75 panelists indicated that their choice of packaging for energy drinks beverage is tin can. This could be accounted for by the benefits of metal packaging wherein cans can provide a barrier against moisture, odors, light and growth of microorganisms. Canned beverages are strongly resistant to moisture due to the presence of aluminum oxide that acts as a protective against corrosion, light, water and microorganisms. Moreover, through canned packaging,

consumers are assured of a shelf-stable product. Compared to tin can, only 57.33% preferred plastic bottles and 54.67% chose glass as other packaging materials for energy drinks. Plastic bottles have disadvantages such as lesser protection against light and air and lack strength in terms of weight bearing and crushing. Also, glass bottles have disadvantages such as its fragility and heaviness.

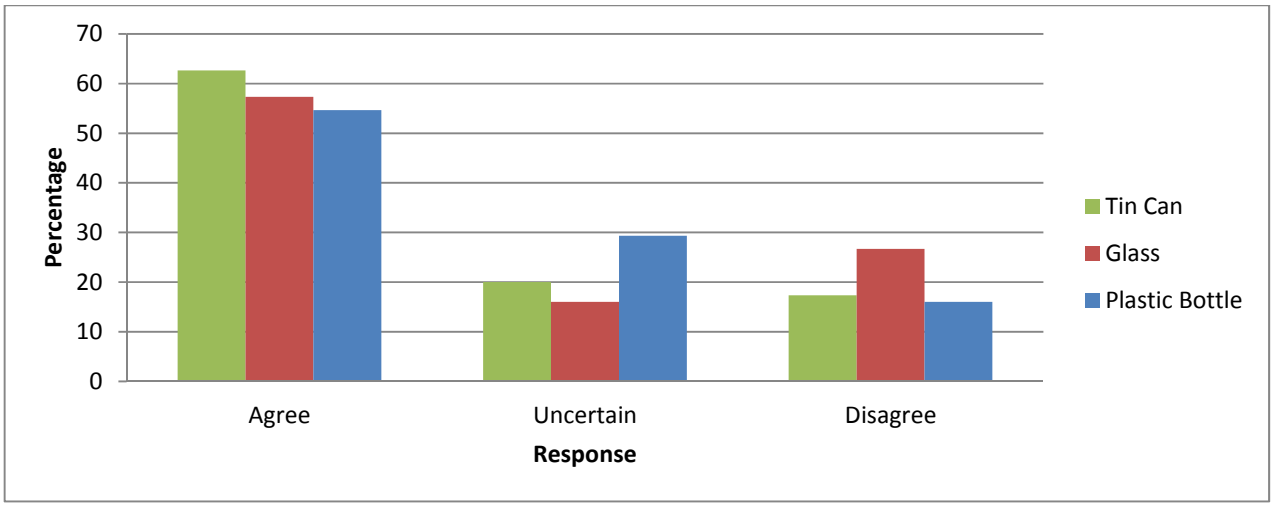

Figure 1. Packaging Preference of Consumers on Energy Drinks.

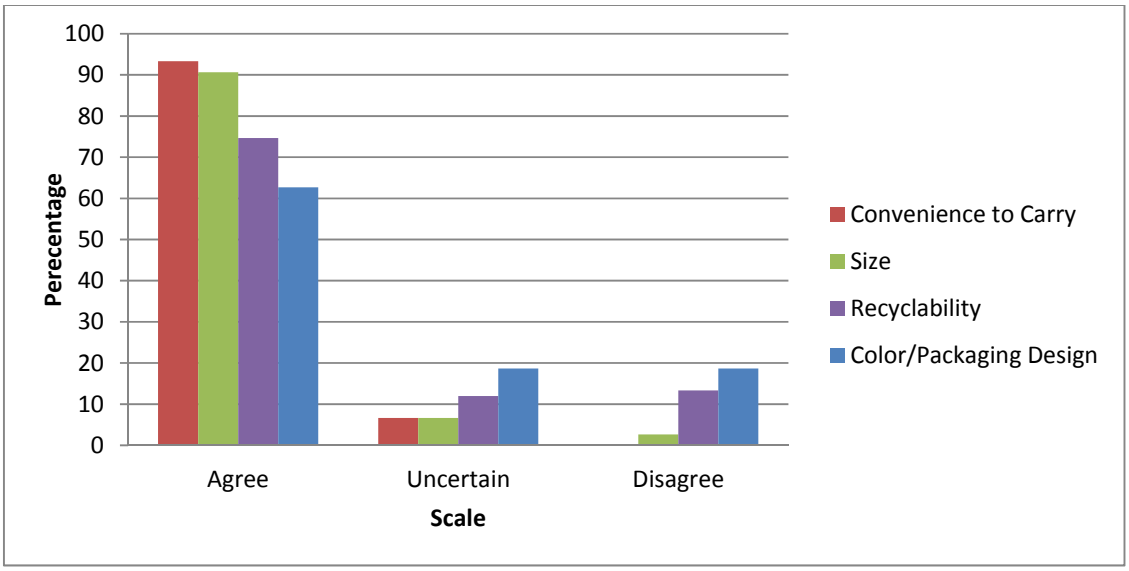

Figure 2. Consumer Response on Packaging Quality of Energy Drinks.

Among the 75 respondents, 93.33% identified that the main feature of the packaging material should be its convenience to carry by consumers. This is closely related to size of the packaging material, wherein 90.67% consumers considered it as another important packaging characteristic. Lightweight packaging provides low transportation costs and supports improved sustainability [9]. One of the functions of food packaging materials is the transport function. This can be obtained through lightweight packaging wherein there is an effective and easy movement of goods from the point of production to the point of final consumption. The less preferred qualities of packaging materials are recyclability, at 74.67% and colour of the packaging material, at 62.67%.

Recyclability is low since most of the packaging materials cannot be reused again like plastic bottles. Colour is one of the means of food packaging manufacturers to inform and sell. However, the visual aspect based from the results is considered less important compared to the convenience characteristic of packaging materials.

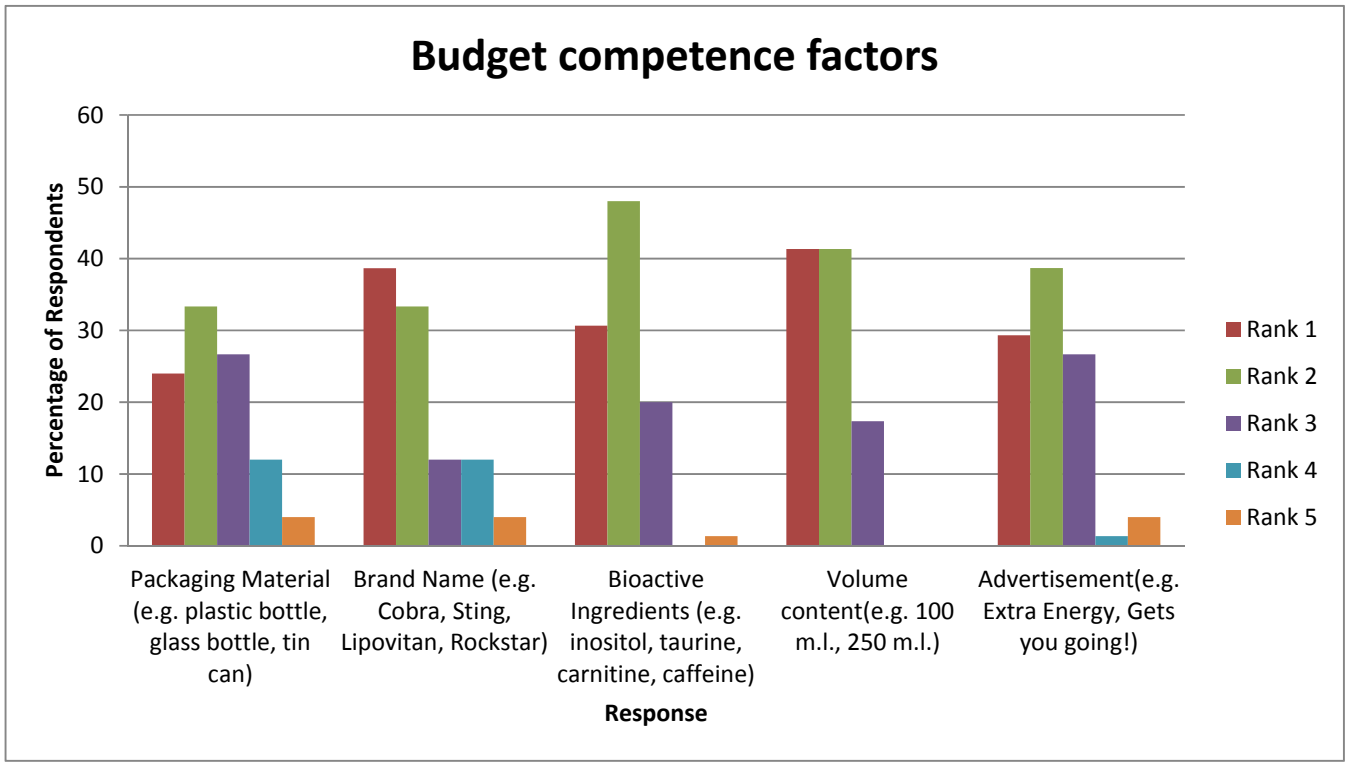

Figure 3. Factors Affecting Budget Competence of Energy Drinks

Figure 3 indicates the ranking of the factors believed to affect the market prices of energy drinks. The respondents used one (1) as ranking for major factor, followed by two (2) as the next major factor, three (3) if it influences the price rate of the beverage, but is not the major nor the least factor and four (4) and five (5) depending on how strongly you believe it is the least of the factors of the economic value or price of the energy drinks.

Among the different factors that affect the budget competence of energy drinks, 41.33% of the seventy five respondents believed that the volume content of the drink itself is the next major influence of its price. The factor believed by the respondents to be the secondary influence is the amount of the bioactive ingredients present in it. 48% of the respondents ranked it as second. According to the United States Department of Agriculture (USDA) in 2012, 14% of commodity prices affect the amount of products (e.g. ingredients like Inositol, Sorbitol, Glucose, etc.)

The next factors believed to influence the budget competence of energy drinks, but not ranked as the least nor the major factors, are the packaging material of the beverage and the advertisements used to persuade people to buy the products. Both were ranked third with the percentage of 26.67%. According to Brajdeep [10], beverage companies are spending a lot of money on their advertisements and about 35% of the total costs of these companies were spent on marketing. On the other hand, the

USDA said that food packaging is one of the causes that affects 86% of the total expenses of manufacturing companies together with food processing, retail trade, food services and some other factors. The two factors ranked least that may affect the price of energy drinks were brand name and, again, packaging material. Both ranked fourth (4^{th}) in 12% and also ranked fifth (5^{th}) in 4%.

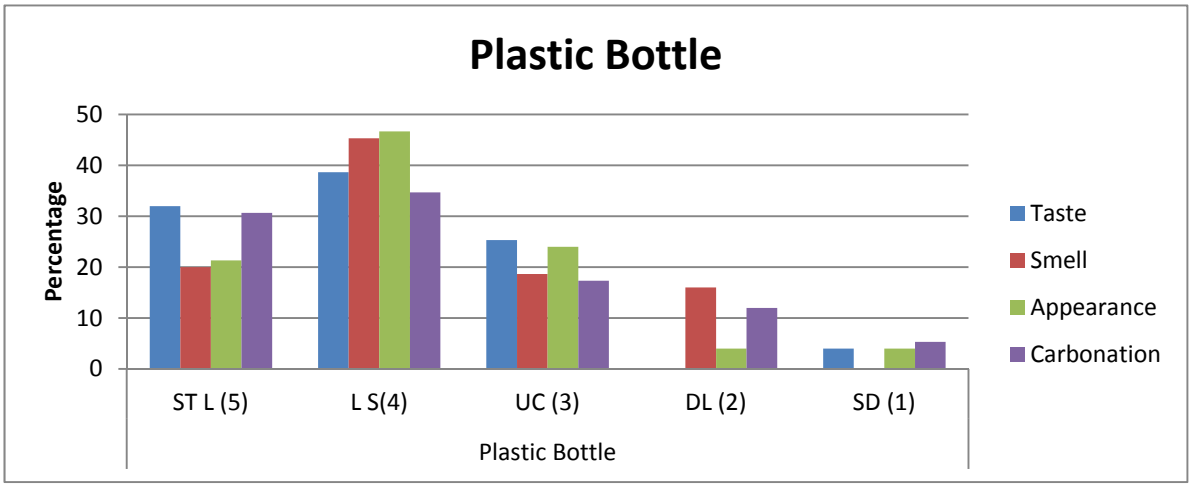

Figure 4.1. Sensory Acceptability of Energy Drinks Placed in Plastic Bottle
*ST L= Strongly Dislike, L S= Liked Slightly, UC= Uncertain, DL= Dislike, SD = Strongly Dislike

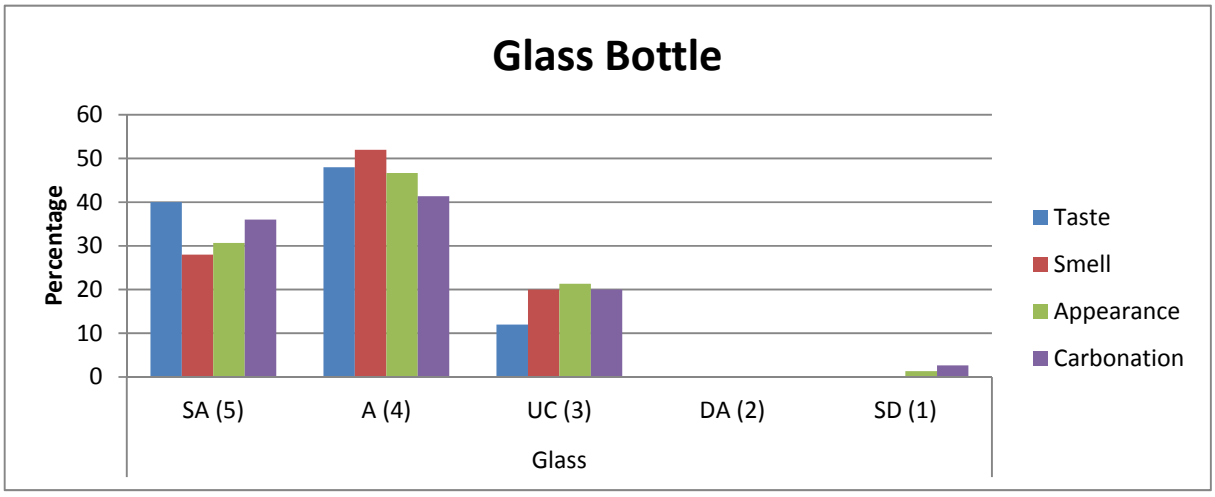

Figure 4.2. Sensory Acceptability of Energy Drinks Placed in Glass Bottle
*ST L= Strongly Dislike, L S= Liked Slightly, UC= Uncertain, DL= Dislike, SD = Strongly Dislike

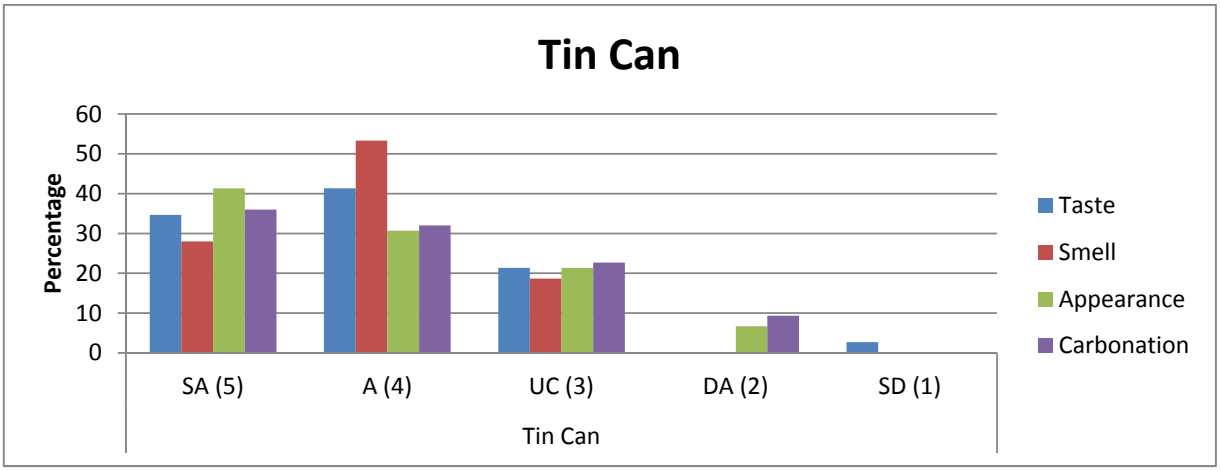

Figure 4.3 Sensory Acceptability of Energy Drinks Placed in Tin Cans

*ST L= Strongly Dislike, L S= Liked Slightly, UC= Uncertain, DL= Dislike, SD = Strongly Dislike

Figures 4.1, 4.2 and 4.3 show the sensory acceptability of energy drinks placed in different containers namely: plastic bottle (Fig. 4.1), glass bottle (Fig. 4.2), and tin can (Fig. 4.3). The respondents were asked to rank the energy drinks placed in these containers based on taste, smell, appearance and carbonation.

Energy drinks placed in glass bottles had the most number of respondents, at 40%, who strongly liked its taste. The other 48% of the respondents slightly liked its taste while 12% of the respondents were uncertain if its smell was acceptable (Fig. 4.2). Energy drinks in tin cans placed second with 34.67% of respondents who strongly agreed that it has the most acceptable taste followed by the other 41% of the respondents who found its taste slightly acceptable. The other 21.33% were uncertain if its taste is likeable or not while the other respondents, at 2.67%, strongly did not find its taste acceptable (Fig. 4.3). Energy drinks placed in plastic bottles had the least number, with 32%, of the respondents who strongly liked its taste. The other 38.67% of the respondents found its taste slightly acceptable. The rest, at 25.33% of the respondents, were uncertain if its taste was acceptable while 4% strongly did not find its taste tolerable.

When it comes to smell, both energy drinks placed in glass bottles and tin cans had the most number of respondents, at 28%, who strongly found it acceptable (Fig. 4.2 and 4.3). Energy drinks placed in glass bottles also had 52% of the respondents who slightly liked its smell followed by the other 20% who were uncertain of its smell acceptability (Fig. 4.2). Canned energy drinks were found by 53.33% of the respondents to have a slightly likeable smell followed by the 18.67% who were uncertain if its smell is acceptable or not (Fig. 4.3). Contrarily, energy drinks placed in plastic bottles had the least number of respondents, with 20%, who strongly liked its smell. 45% of the respondents found its smell slightly acceptable while 24% were uncertain of its smell acceptability. On the other hand, 4% of the respondents disliked and another 4% strongly disliked its smell (Fig. 4.1).

When it comes to appearance, a great number of 41.33% of the respondents strongly liked energy drinks placed in tin cans (Fig. 4.3). 30.67% of them slightly liked it while 21.33% were uncertain if its appearance is acceptable or not. In contrast, 6.67% of the respondents did not like its appearance (Fig. 4.3). The second strongly liked energy drink was the one placed in glass bottles with 30.67% of

the respondents who strongly liked it (Fig. 4.2). 46% of other respondents slightly liked it, while 21.33% were uncertain of its visual acceptability. The rest, with 1.33%, did not like its appearance (Fig 4.3). Again, energy drinks in plastic bottles had the least number of respondents who strongly liked it with only 21.33% of them. 46% of the respondents slightly liked it visually while 24% were uncertain if its appearance is acceptable or not. The other 4% of the respondents disliked it and the other 4% also strongly disliked it (Fig. 4.3).

When it comes to carbonation, both glass and tin can had the most number of respondents, both 36%, who strongly liked it (Fig. 4.2 and 4.3). Glass bottle had 41.33% of the respondents who slightly liked its carbonation and 20% were uncertain if its quality is acceptable or not. However, 2.66% of the respondents strongly did not like its carbonation (Fig. 4.2). In tin canned energy drinks, 32% of the respondents slightly liked its carbonation while 22.67% were uncertain of its carbonation acceptability. On the other hand, 9.33% did not like the said quality of energy drink placed in the tin can (Fig 4.3). Again, plastic bottles attained the least percentage of respondents, with 30.67%, who strongly liked its carbonation. 34.67% of the respondents slightly found its carbonation acceptable while 17.33% were uncertain about its said quality, while 12% found it unacceptable and 5.33% strongly disliked (Fig. 4.1).

Table 1. Means scores on smell evaluation of energy drinks in different packaging materials at level of p<0.05.

	Plastic (PET)	Glass	Tin Can
Means scores	3.7 [a]	4.08[b]	3.99 [b]

**** Dissimilarity of letters indicates significant difference.*

Table 2. Means scores on effects of quality on packaging preference.

Colour	Convenience to Carry	Size	Recyclability
281[a]	350[bd]	335[cb]	307[ac]

**** Dissimilarity of letters indicates significant difference.*

Conclusions and Recommendation

Packaging is important as it gives an impression of the product's aesthetic quality and preserves the product. In this study, quality factors such as convenience to carry and sensory perceptions can affect the packaging preference of the consumer. Also, consumers look into the amount that the packaging material contains to fit their budgetary requirements, i.e., the amount of beverage in the package. The researchers assume that the higher the volume of the product, the more the product is worth buying especially if the same kind of product is being sold at the same price but lesser volume.

However, the use of different brands of energy drinks in this study can also affect the preference of the consumer. It is recommended that only one brand of energy drinks of the same kind that is packaged in different materials should be used in any future study.

References

1. Labbe, D., Pineau, N. and Martin, N. (2013). Food expected naturalness: Impact of visual, tactile and auditory packaging material properties and role of perceptual interactions. ***Food Quality and Preference*****,** 27(2), 170-178.

2. Rebollar, R., Lidón, I., Serrano, A., Martín, J. and Fernández, M. (2012). Influence of chewing gum packaging design on consumer expectation and willingness to buy. An analysis of functional, sensory and experience attributes. ***Food Quality and Preference*****,** 24(1), 162-170.

3. Puyares, P., Ares, G., & Carrau, F. (2010). Searching a specific bottle for Tannat wine using a check-all-that apply question and conjoint analysis. ***Food Quality and Preference*****,** 21(7), 684-691.

4. Deliza, R., Rosenthal, A., Abadio, F.B.D., Silva, C.H.O. and Castillo, C. (2005). Application of high pressure technology in the fruit juice processing: benefits perceived by consumers. ***Journal of Food Engineering*****,** 67(1–2), 241-246.

5. Park, S., Onufrak, S., Blanck, H.M. and Sherry, B. (2010). Characteristics Associated with Consumption of Sports and Energy Drinks among US Adults: National Health Interview Survey. ***Journal of the Academy of Nutrition and Dietetics*****,** 113(1), 112-119.

6. Smit, H.J. and Rogers, P.J. (2002). Effects of 'energy' drinks on mood and mental performance: critical methodology. ***Food Quality and Preference*****,** 13(5), 317-326.

7. Glade, M.J. (2010). Caffeine—Not just a stimulant. ***Nutrition*****,** 26(10), 932-938.

8. Giles, G.E., Mahoney, C.R., Brunyé, T.T., Gardony, A.L., Taylor, H.A. and Kanarek, R.B. (2012). Differential cognitive effects of energy drink ingredients: Caffeine, taurine and glucose. ***Pharmacology Biochemistry and Behavior*****,** 102(4), 569-577.