

Product attribute analysis for latte drinks: Implications for a coffee-flavored carabao milk-based drink

Ilao, S.M.M., Panabang, M.B., *Depositario, D.P.T. and Baticados, G.N.

Department of Agribusiness Management and Entrepreneurship, College of Economics and Management, University of the Philippines Los Baños, College, Laguna, Philippines

Article history

Received: 28 December 2015

Received in revised form:

18 March 2016

Accepted: 23 March 2016

Abstract

This research generally aims to determine the product attributes important in latte drinks and the specific preferences for the attributes among three potential target market segments for a coffee-flavored carabao milk-based drink. Six focus group discussions (FGDs) and a consumer survey with 120 respondents were conducted among high school, college and working professionals. Descriptive statistics such as frequency counts, percentages and means as well as non-parametric tests specifically Wilcoxon Signed-Rank Test and Kruskal-Wallis Test were utilized in the study. Among working professionals, taste was the single most important attribute; among college students, taste and aroma; and among high school students, taste, aroma, and texture. The working professionals preferred a latte drink to be more of coffee in terms of taste; the college students, more of milk in terms of taste but more of coffee in terms of aroma; and the high school students, more of milk in terms of taste, aroma and texture. The results suggest a need to employ conjoint analysis to get the optimal product formulation for Carakafe. The results also suggest that PCC-UPLB could come up with Carakafe variants in order to cater to all segments in the long-run.

Keywords

Product attributes

Coffee-flavored milk

Carabao

Latte drinks

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Introduction

Milk is not only considered as a drink but also as the most complete food. This is because of its high nutritional value derived from selected animals such as cow, carabao and goat. In the Philippines, according to FAO estimates, annual per capita milk consumption is at 22 kg compared with Thailand at 26 kg, Malaysia at 52 kg and the United States at 287 kg (Ang, 2012). Another beverage which Filipinos love is coffee. From company CEOs to carpenters to vendors, almost everyone starts the day with a cup of coffee to keep them awake.

Frequently, coffee is consumed after adding milk but lately, dairy-based coffee flavored beverages have become very popular. The chilled ready-to-drink or iced coffee sector has experienced significant growth in recent years, with the majority (53%) of RTD coffee introductions taking place in Asia, ahead of Europe with 30 percent and North America with 11.5 percent (Bowling, 2014). Food Editorial.com (2015) notes that in 2008, coffee had become more appealing to the younger crowd and the consumption of cups per day by consumers age 18-24 continued to trend higher. In the Philippines, the local RTD coffee category continues to cater to a niche of young urban consumers who want alternative soft drink products

to stay awake and refreshed during the day. Total constant value sales of RTD coffee are projected at Php 388 million and the total volume compound annual growth rate (CAGR) at 3% by the end of 2018 (Euromonitor International, 2014).

The growing popularity of coffee as well as iced-coffee among the younger crowd has led the Philippine Carabao Center (PCC) - University of the Philippines Los Baños (PCC-UPLB), an attached agency of Department of Agriculture (DA), to develop a carabao milk-based product in 2011 named "Carakafe". It is a cold ready-to-drink beverage that claims to have a perfect blend of coffee and milk.

The product is a chilled coffee-flavored buffalo milk-based drink which uses pure carabao's milk from PCC-UPLB's institutional herd/ farm. It is currently being sold at P30.00 per 200 ml. As for the coffee flavor, Philippine-grown kapeng barako from Cavite, Philippines is utilized. The manufacturing of the product is done in PCC-UPLB's kitchen-type facility along with the other buffalo milk-based products. The coffee-flavored milk's storage temperature requirement is 0- 4°C (chiller temperature) and its estimated shelf life, 14 days. The developers claim that the product is very high in antioxidants with 0 transfat and 0 cholesterol. The product is packed in 200 ml PET food-grade bottles especially made for

*Corresponding author.

Email: dtdepositario@up.edu.ph, dinahpura@yahoo.com

liquid dairy beverages.

Carakafe was formulated to approximate a popular coffee drink – latte, more specifically cold latte. The latte is a coffee drink made with espresso and steamed milk. The term as used in English is a shortened form of the Italian *caffè latte* or *caffelatte*, which means “milkcoffee” (Merriam-Webster Dictionary, n.d.; Oxford Dictionaries, n.d.). A product attribute analysis is the starting point in determining an optimal formulation particularly in the case of a product like coffee-flavored milk. The analysis will uncover the attributes that consumers want which must be communicated through the design of the product. In a study of consumption patterns and attribute preferences of packed coffee drinks among young adults in Taiwan, Hsu and Hung (2005) pointed that understanding the attribute preferences among the coffee-drinking young adults can help manufacturers develop effective marketing strategies to reach this consumer segment.

Consumer-led insights for the design of product development strategies can make Carakafe more appealing to its target market segments. A product attribute analysis is especially needed where a coffee-flavored dairy beverage is concerned. There is a trade-off decision about the level of coffee extract that has to be made as the addition of milk can decrease the bitterness of coffee. On the other hand, increasing the coffee flavor by adding more coffee extract increase bitterness intensity (Li, 2014).

This research generally aims to determine the important product attributes of latte drinks and the specific preferences for the attributes among three potential target market segments for a coffee-flavored Carabao milk-based drink. More specifically, it aims to: 1) identify the product attributes that are important in latte drinks among three potential target market segments; 2) evaluate the Philippine Carabao Center-University of the Philippines Los Baños (PCC-UPLB) coffee-flavored milk in terms of the identified important attributes of latte drinks and the specific preferences for the attributes by the three groups; 3) identify gaps between the desired attributes and the current product attributes; and 4) suggest product development strategies to address the gaps.

Materials and Methods

The study used the exploratory market and the descriptive research designs. Focus group discussions (FGDs) and a consumer survey were the methods used for data gathering. Six FGDs were conducted with six participants each. The FGDs were

conducted to identify the important attributes of latte drinks from the perspective of three potential target segments - high school students, college students and working professionals. There were two independent sessions held for each of the potential segments – high school students, college students and working professionals. The FGD participants were fourth-year high school students from TRACE College in Los Baños; undergraduate students from various colleges in UPLB; and employees from UPLB. All the participants were aware of and familiar with latte drinks.

On the other hand, the consumer survey covered a total of 120 respondents – 40 for each potential segment. In the survey, the respondents were first asked Usage, Attitude and Image (UAI) questions. They were then asked to evaluate the degree of importance of each latte drink attribute using a 5-point Likert scale. Afterwards, the respondents were asked to taste the product and rate the attributes of Carakafe using a 5-point Likert scale. Prior to the participants’ tasting the product, the researchers in observance of the informed consent process, elicited the participants’ willingness to participate in the research. Lastly, the respondents were asked about their likelihood to buy the product.

Descriptive statistics such as frequency counts, percentages and means were used to analyze the demographic profile and latte drink consumer behavior as well as the attribute and product ratings of the respondents. Content analysis of the qualitative responses from the FGDs and consumer survey was also done.

Further, non-parametric tests, specifically the Wilcoxon Signed-Rank Test and Kruskal- Wallis Test, were also employed in the study. The former was conducted to determine the Wilcoxon rank of each latte drink attribute. This method tests whether there are significant differences in the mean ratings of two consecutively-ranked attributes. On the other hand, the Kruskal- Wallis test was used to determine whether there were significant differences in mean rankings in the importance ratings for all product attributes across the three groups, in the mean rankings of actual ratings for all attributes across the three groups and in the likelihood to buy ratings among the three potential segments.

Results and Discussion

Demographic profile and latte consumption behavior of the respondents

A total of 120 respondents - 40 high school students, 40 college students and 40 working

Table 1. Importance rating of latte attributes among the three groups

Attribute	High School Students		College Students		Working Professionals	
	Mean Rating	Rank*	Mean Rating	Rank*	Mean Rating	Rank*
Taste	1.43	1	1.28	1	1.33	1
Aroma	1.53	1	1.40	1	1.55	2
Texture	1.55	1	1.73	2	1.75	2
Appearance	1.65	2	2.03	3	2.05	3
Creaminess	1.75	2	1.88	2	1.88	3
Aftertaste	1.78	2	1.78	2	1.90	3
Price	1.88	2	1.88	2	1.85	3
Packaging	2.35	3	2.45	4	2.60	4
Brand name	2.63	3	3.05	5	3.10	5

LEGEND: 1- Very important *Rank after Wilcoxon Signed-Rank Test ($\alpha = 0.10$)

2- Important

3- Neither Important nor Important

4- Unimportant

5- Very Unimportant

professionals - participated in the consumer survey and product test. Among the high school student-respondents, majority (55%) were male. On the other hand, among the college students and working professionals, majority were female (72.5% and 62.5%, respectively). The high school students were all 14-17 years old while more than two-thirds (70%) of the college students belonged to the 18-21 age group. The working professional respondents were mostly employees aged from 22-25 years old (50%) and 26-29 years old (25%).

Majority of the high school students (57.5%) had a monthly allowance of less than Php 1,999.00 while the college students, as expected, had a higher monthly allowance, ranging from Php 4,000 to 4,999 (30%) and Php 3,000 to 3,999 (27.5%). and Php 4,000 to 4,999 (30%). Majority of the working professionals, on the other hand, had a monthly income of greater than Php 20,000 (57.5%) and Php 15,000.00 – Php 19,999.00 (35%).

The frequency of latte consumption among high school students varied from “when they feel like drinking latte/ when they have money” (30%), once a week (25%) to everyday (15%). On the other hand, almost half (45%) of the college students reported to drink latte when they feel like it/ when they have money and more than one-fourth (27.5%) drink latte everyday. A reverse trend was observed in the consumption behavior among the working professionals. Almost half (42.5%) of the working professionals drink latte everyday and some (20%) responded that they drink latte when they feel like it or when they have money.

In relation to the place of purchase, most of the college students and working professionals usually buy latte from supermarket/ groceries (57.5%) and coffee shops (50%) while high school students usually

buy latte from coffee shops (45%) and supermarkets/ groceries (32.5%).

Importance rating of latte drink attributes

A 5-point Likert scale was used to assess the importance of each attribute of latte drinks. The attributes considered were aftertaste, appearance, aroma, creaminess, taste, texture, brand name, packaging and price. These attributes were the ones which were pre-identified in the FGDs.

Taste was consistently rated as the most important or one of the most important attribute(s) across the 3 segments. To test whether there were significant differences in the mean ratings of two consecutively-ranked attributes for each group, Wilcoxon Signed-Rank Test was employed (Table 1).

For the high school students, taste, aroma, and texture were ranked equally as most important attributes. Meanwhile, appearance, creaminess, aftertaste and price were equally ranked as the next most important attributes while packaging and brand name were both considered the least important attributes.

From the FGD sessions, there were mixed descriptions of the high school students’ preference for taste, with most of the FGD respondents specifying that the level of sweetness should be from “not too sweet” to “sweet”. Though latte drinks contain coffee which has a naturally bitter taste, high school students expressed that they do not like that the product would taste bitter. In terms of aroma, a “sweet” aroma was generally preferred by the high school students. In general, sweet aroma is associated with the aroma of milk while strong aroma is linked to the coffee content. For the texture, most high school student respondents expressed that they wanted a latte’s texture to be smooth, tender or soft and foamy

Table 2. Importance rating across groups Kruskal-Wallis results

Attributes	Mean Ratings	Rank	p-value
Taste	1.34	1	0.277
Aroma	1.49	2	0.568
Texture	1.68	3	0.602
Aftertaste	1.82	4	0.634
Creaminess	1.83	5	0.809
Price	1.87	6	0.903
Appearance	1.91	7	0.033**
Packaging	2.47	8	0.472
Brand name	2.93	9	0.105

LEGEND: 1- Very important ** significant at 5% alpha
 2- Important
 3- Neither Important nor Important
 4- Unimportant
 5- Very Unimportant

or frothy. On the other hand, the college student respondents considered taste and aroma as the most important attributes. The college student respondents preferred a balance of sweetness and bitterness or a bittersweet taste in a latte drink. They also preferred the product to have a strong coffee aroma.

Lastly, the working professional respondents considered taste as the most important attribute. They specified that the product's taste should be dominantly coffee rather than milk. Since the product was latte, the working professionals also wanted to taste the attributes of the milk but preferred that their latte drink should not be too sweet. Kruskal-Wallis Test was employed to test for the differences in mean ranks of the importance ratings for all attributes across the three groups. The 3 groups' ranks were found to be significantly different only in terms of appearance (with $p=0.033$) (Table 2).

This result can be linked to the observation that the importance rating of high school students for the attribute of appearance (1.65) was markedly different from that of the college and working professionals groups (2.03 and 2.05, respectively). Even in terms of rank, appearance was ranked second by the high school students while the two other groups ranked it third. The high school students expected a latte drink to have a mouth-watering, brownish white or light brown appearance. A foamy or frothy texture of the latte, for the high schoolers, is vital to a drink's having a mouth-watering quality.

Comparison between the actual product attribute ratings and the attribute importance ratings

Table 3 compares the actual product attribute ratings and the attribute importance ratings in an attempt to identify gaps between the desired attributes and the current product attributes. The mean ratings for the three most important attributes considered by high school students (taste, texture and aroma) was 2.05 for all. Though this mean rating can be interpreted as Like, the mean ratings for the three attributes were the lowest among all the mean ratings

given by the three respondent-groups for the most important attributes. The probable reason for the not-so-high mean rating of the high school students is that, based on the FGD and product test results, there was still a significant number who found the product to be bitter whereas they preferred a latte drink to be sweet. As for aroma, most of the high school respondents expressed that the smell of coffee was more dominant and they wanted the smell of milk to prevail. Lastly, in terms of texture, majority of the high school respondents described that the product's texture did not conform to what that wanted, that is smooth, tender or soft and foamy or frothy.

On the other hand, the mean rating for the two most important attributes considered by college students was 1.88 (mean rating for taste) and 1.98 (mean rating for aroma), which are also both nearer the Like rating. The college students described Carakafe's taste as delicious, specifically bittersweet which is what they want. Likewise, majority of the college students described the product as having a coffee aroma which is what they prefer, thus he higher rating vis a vis the rating given by the high school students.

Lastly, among the working professionals, the mean rating for the most important attribute – taste – was 1.80, which though still near to Like, was already the highest among all the ratings for most important attributes given across the three groups. Working professionals described the product as tasting bitter or more of coffee which is what they prefer.

A Kruskal-Wallis Test was also done to test for the differences in the rankings of actual ratings for all attributes across the three groups. Based on the p-value, the ranking of actual ratings for all attributes across the three groups is the same (Table 4).

Likelihood to buy the product

Generally, college students and working professionals claimed that they would likely buy the product while the high school students indicated

Table 3. Comparison of actual product attribute ratings and attribute importance ratings across the three groups

Attribute	High School Students				College Students				Working Professionals			
	Actual Rating ^a	Inter-pretation	Impor-tance Rating ^b	Rank ^c	Actual Rating ^a	Inter-pretation	Impor-tance Rating ^b	Rank ^c	Actual Rating ^a	Inter-pretation	Impor-tance Rating ^b	Rank ^c
Taste	2.05	L	1.43	1	1.88	L	1.28	1	1.80	L	1.33	1
Aroma	2.05	L	1.53	1	1.98	L	1.40	1	2.23	L	1.55	2
Texture	2.05	L	1.55	1	2.33	L	1.73	2	2.18	L	1.75	2
Appearance	2.15	L	1.65	2	2.33	L	2.03	3	2.50	NLD	2.05	3
Creaminess	2.28	L	1.75	2	2.10	L	1.88	2	2.15	L	1.88	3
Aftertaste	2.73	NLD	1.78	2	2.43	L	1.78	2	2.48	L	1.90	3
Price	2.60	NLD	1.88	2	2.68	NLD	1.88	2	2.63	NLD	1.85	3
Packaging	2.50	NLD	2.35	3	2.68	NLD	2.45	4	2.78	NLD	2.60	4
Brand name	2.55	NLD	2.63	3	2.53	NLD	3.05	5	2.58	NLD	3.10	5
Mean rating	2.33	L			2.33	L			2.37	L		

LEGEND:

- ^a 1- Like Very Much (LVM)
- 2- Like (L)
- 3- Neither Like nor Dislike (NLD)
- 4- Dislike (D)
- 5- Dislike Very Much

- ^b 1- Very important
- 2- Important
- 3- Neither Important nor Important
- 4- Unimportant
- 5- Very Unimportant

^c Rank after Wilcoxon Signed-Rank Test ($\alpha=0.10$)

Table 4. Actual rating across groups Kruskal-Wallis results

Attributes	Mean Ratings	Rank	p-value
Taste	1.91	1	0.442
Aroma	2.08	2	0.376
Creaminess	2.18	3	0.655
Texture	2.18	4	0.297
Appearance	2.33	5	0.255
Brand Name	2.53	6	0.903
Aftertaste	2.54	7	0.437
Price	2.63	8	0.905
Packaging	2.65	9	0.317

- LEGEND: 1- Very important
 2- Important
 3- Neither Important nor Important
 4- Unimportant
 5- Very Unimportant

indifference towards buying the product (Table 5). Almost half (45%) of the high school student respondents specified that they were indifferent in terms of likelihood to buy the product. The indifference of quite a number of them to buy the product may be linked to their feedback that the coffee flavor overpowers the milk flavor which resulted to a strong taste and a bitter aftertaste.

Majority of the college student respondents (57.5%) specified that they would likely buy the product. Based on these results, the college students could be a good target market for the product because of their likelihood to buy the product. However, further improvements from their perspective on the product could be done as there were also some respondents (37.5%) who claimed to be indifferent to buying the product. Meanwhile, most of the working

professional respondents reported that they would likely buy the product. The working professionals claimed they particularly liked the taste of Carakafe.

Kruskal -Wallis Test was performed to know whether the likelihood to buy ratings significantly differed across groups. The test results showed that there were no significant differences in the likelihood to buy ratings among the high school students, college students and working professionals ($p = 0.714$).

Conclusions

Taste emerged as either the most important or at least one of the most important latte drink attribute(s) across the 3 segments. Among working professionals, taste emerged as the single most important attribute; among college students, taste and aroma; and among high school students, taste, aroma, and texture. This result suggests that the working professionals were more discriminating as far as the attribute of taste of latte drinks are concerned as they were able to distinguish and separate the taste attribute from all the other attributes.

Interestingly, there were differing preferences in terms of the characteristics or levels of the important attributes. The working professionals preferred a latte drink to be more of coffee in terms of taste; the college students, more of milk in terms of taste but more of coffee in terms of aroma; and the high school students, more of milk in terms of taste, aroma and texture.

Though Carakafe's attributes were generally found to be liked by the three groups, not one of the attributes was rated as Like Very Much by any

Table 5. Likelihood to buy the product across the three groups

Likelihood	Segments/ Groups					
	High School Students (n=40)		College Students (n=40)		Working Professionals (n=40)	
	F	%	F	%	F	%
Very Likely	5	12.5	2	5.0	4	10.0
Likely	16	40.0	23	57.5	23	57.5
Indifferent	18	45.0	15	37.5	10	25.0
Very Unlikely	1	2.5	0	0.0	2	5.0
Unlikely	0	0.0	0	0.0	1	2.5
Mean Rating	2.38		2.33		2.33	

LEGEND: 1- Very Likely
2- Likely
3- Indifferent
4- Unlikely
5- Very Likely

group. There is thus room for still improving all the attributes of Carakafe, especially the identified most important attributes of taste, aroma and texture. Further, there were no significant differences in the ranking of actual ratings of product attributes across groups as well as the likelihood to buy ratings. This implies that all the three segments can be considered as potential target markets.

The findings of this research suggest that there is a need to employ conjoint analysis. Through this technique, the importance of attributes as well as the levels of each attribute can be assessed. In the process, the optimal product design or formulation can be developed (Hair *et al.*, 1998). The results also imply that PCC-UPLB could come up with Carakafe variants in order to cater to all segments in the long-run to appeal to working professionals, college students and high schoolers. Further, to make Carakafe more appealing to college and high school students, the product developers could incorporate more functional properties in the drink such as its being able to boost energy, enhance health and promote weight loss.

The product variants and addition of functional properties will hopefully make Carakafe more marketable to college and high school students who comprise a bigger and potentially profitable market. As cited in a Datassential study (2014), younger coffee drinkers define “coffee” through a broader lens which include all formats (i.e., hot and cold, brewed and specialty) and this will make coffee compete more directly against other beverage types (like juice, water, carbonated soft drinks, etc.).

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