

Understanding Indonesian People: Consumer Acceptance and Emotions Study of Green Tea Products from Thailand

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Abstract

Evaluation of emotions as part of other sensory tests is gaining momentum in the sensory science and consumer. The EsSense Profile® was developed for studying the impact of food on consumer's emotions. Consumer will express their emotions when consuming products. The objective of this research was to measure emotion responses obtaining from Indonesian people by using EsSense Profile®. Fourteen samples of green tea produced from Chinese variety and Assam variety were used in this study. Check-all-that-apply (CATA) method was used to screen the emotion terms. Eight terms were selected from a total of 39 emotion terms as calm, good, good-nature, happy, peaceful, pleasant, tender and warm as key emotion terms that are related to Thai tea products. Consumers were rated their emotions on a 5-point intensity scale before and after drinking tea. It was found that intensity of emotional response of green tea (Assam variety) was significantly different ($p < 0.05$) when compare before and after drink whereas green tea (Chinese variety) was not significantly different ($p \geq 0.05$). Indonesian people accepted green tea produced from Chinese variety (72.1 %) more than Assam variety (52.7 %). Result from logistic regression indicated that color and taste were influential attributes affecting overall acceptance for green tea (Chinese variety) whereas color, aroma, flavor and taste were influential attributes for Assam variety. Indonesian people considered color, flavor and taste as key attributes affecting purchase intent. This result will provide incremental information regarding consumer tests and overall acceptability data and also help connect marketing with product development efforts via consumer emotions and acceptability ratings.

Keywords: Consumer acceptance, Emotions, Green tea

1. Introduction

Tea is one of the world's most consumed beverages, with over 290 billion litres sold in retail and food services. The growth rate of bottled tea consumption is outpacing bottled water, carbonates, beer and coffee. Tea consumption is largely concentrated in Asia, especially in China, India and Pakistan

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Tea leaves (*Camellia sinensis* L.) are the most popular drink. It is a plant rich in polyphenols and flavonoids [1]. Nowadays, tea consumption is increasing due to their benefits. Polyphenols have beneficial effects such as antioxidant, antibacteria and anticancer [2]. In Thailand, tea products (green tea, oolong tea and black tea) are made from fresh tea leaves of two varieties as Chinese tea (*Camellia sinensis* var. *sinensis*) and Assam tea (*Camellia sinensis* var. *assamica*). Tea is generally classified into 3 groups base on fermentation process i.e. green tea (non-fermented), oolong tea (semi-fermented) and black tea (fully fermented) [3]. Different tea processing affect to quality and taste.

Sensory evaluation by consumer is important in the development of the product itself for new product development guidance, product improvement and optimization and product maintenance [4]. Sensory perceptions are what consumers associate with food quality and they have great influence in determining consumer acceptance and purchase intent for food products [5]. Consumer acceptability evaluation can provide the most important and reliable information because only consumers can accurately indicate the degree of liking or preference for a product. The expectation of liking and emotions play an essential role in food perception by consumers. Measuring emotions as part of other sensory tests is gaining momentum in the sensory science and consumer. The EsSense Profile® methodology, presented in 2008 [6] and published in 2010 [7], is one of such methods. The EsSense Profile® measures short and relatively intense responses about consumer products. Thus, the objective of this study was to investigate relationship between acceptability and emotions of tea products from Thailand. This result will provide information on consumers' overall acceptability data and help connect marketing with product development efforts via consumer emotions and acceptability ratings.

2. Materials and Methods

2.1 Material

Fourteen samples of green tea that produced from Chinese variety and Assam variety were used in this study. They were collected from tea factory that located in Chiang Rai and Chiang mai. The samples were kept in aluminum foil bag and hermetically sealed.

2.2 Procedure

There were 500 participants (ages 18-50 years) from Bogor Agricultural University (IPB), Indonesia participated in this study. Panelists often consuming green tea were qualified.

2.3 Emotional term selection

Check-All-That-Apply (CATA) questionnaire was used to screen emotional term with 100 respondents. List of emotions were used in the EsSense Profile® ballot (Table 1). The 39 emotions were selected from the positive, negative and contextual groups of emotions. These emotions were chosen by consumers based on their appropriateness to tea products. Criteria for term selection was based on ≥ 15 % frequency of use on a checklist questionnaire.

Table 1. EsSense Profile® Emotion

	Positive	Negative	Unclassified
Active (aktif)	Joyful (sukacita)	Bored (membosankan)	Aggressive (agresif)
Adventurous (petualang)	Loving (mencintai)	Disgusted (menjijikan)	Daring (berani)
Affectionate (diperhatikan)	Merry (ceria)	Worried (menghawatirkan)	Eager (bersemangat)
Calm (kalem)	Nostalgic (nostalgia)		Guilty (bersalah)
Energetic (energik)	Peaceful (damai)		Mild (biasa saja)
Enthusiastic (antusias)	Pleasant (menyenan)		Polite (sopan)
Free (bebas)	Pleased (bahagia)		Quite (diam)
Friendly (ramah)	Satisfied (memuaskan)		Steady (stabil)
Glad (sangat senang)	Secure (aman)		Tame (mudah dikendalikan)
Good (baik)	Tender (lembut)		Understanding (pengertian)
Good-natured (alami)	Warm (hangat)		Wild (liar/tidak terkontrol)
Happy (senang)	Whole (merasa utuh)		
Interested (menarik)			

2.4 Emotion measurement

Selected emotional terms were used to measure and compare for each sample prior and after consumption. Panelists were asked to indicate their emotion (How do you feel before and after consumption). Panelists (n=50) tested samples in individual test booths to prevent them from bias. Two samples of green tea that produced from Assam and Chinese variety were used in this part. A 3 grams of tea leave was infused with 150 ml of hot water, steeped for 5 minutes and served to panelist with 25 ml. A glass of water and cracker were served to each panelist to cleanse the palate between samples. Paneliste were instructed to score using 5-point scale (1 = not at all, 2 = slightly, 3 = moderately, 4 = very much, 5 = extremely). The consumer overall acceptability were evaluated using 9-points hedonic scale (1 = dislike extremely, 5 = neither like nor dislike, and 9 = like extremely).

2.5 Consumer acceptance

Consumer (n=350 between >20-60 years of age) were recruited from Bogor Agricultural University, Indonesia. In this study, a balanced incomplete block design was used. The balanced incomplete block design with $t=7$, $k=4$, $r=4$, $b=7$, $\lambda=2$ was employed due to the number of samples were too much to evaluate at one time. So each consumer was presented with 4 samples. The order of samples was counter-balanced within and across judge. Each consumer received samples with 3-digit coded in a randomized order. A glass of water was also served to each subject to cleanse the palate between samples. Consumers were asked to provide their demographic information.

They provide acceptability ratings for color, odor, taste and overall liking, all on a 9-points hedonic scale (1 = dislike extremely, 5 = neither like nor dislike, and 9 = like extremely) The binomial type questions (yes/no) was used to evaluate overall product acceptance and purchase intent.

2.6 Statistical data analysis

Each of 39 emotional terms were counted frequencies for each. Term selected with 15 % frequency or more were selected to evaluate emotion with/without sample. Principle component analysis was applied to assess the similarity and differences in emotional term of evaluated green tea. Liking score were subjected analysis of variance (ANOVA) using SPSS 16.0 (SPSS Inc., Chicago, U.S.A.). Duncan's multiple range test (DMRT) were performed to locate the differences among samples. Logistic regression are performed to identify sensory attributes influencing acceptance and purchase intent.

3. Results and Discussion

3.1 Screening emotional lexicon

The 39 emotional terms (EsSense Profile®) were classified into 3 groups as positive, negative and unclassified. Positive emotional terms were active, adventurous, affectionate, calm, energetic, enthusiastic, free, friendly, glad, good, good-natured, happy, interested, joyful, loving, merry, nostalgic, peaceful, pleasant, pleased, satisfied, secure, tender, warm and whole. Negative emotional term were bored, disgusted and worried. Unclassified emotional term were aggressive, daring, eager, guilty, mild, polite, quite, steady, tame, understanding and wild. Screening emotional lexicon of Thai green tea was showed in Figure 1. Result indicated that eight emotional term out of 39 (20.52 %) were selected when responding to CATA ballot. These were positive term include clam, good, good-nature, happy, peaceful, pleasant, tender and warm. It may reflect that consumer feel positivite when they drink tea. These term were selected to measure the emotion before and after drinking tea.

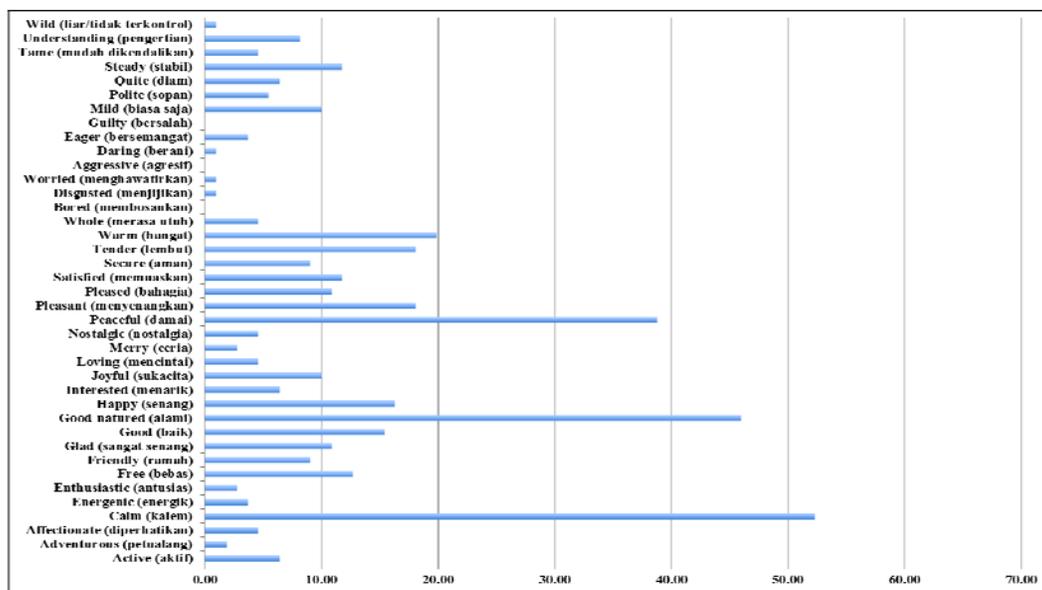


Figure 1. Emotional term screening of Thai green tea by using Check-All-That-Apply (n=100)

3.2 Emotion measurement

Rating scale was used to approach consumer emotions. It was found discrimination between before and after consumption (Table 2). Before consumption and after consumption of green tea made from Chinese variety, emotional term was not significantly difference ($p \geq 0.05$) (Table 2) whereas after consumption of green tea made from Assam variety was significantly different ($p < 0.05$) compared with those before consumption.

Table 2. Emotion scores of Thai green tea products (n = 50)

Emotion	Before consumption		After consumption	
	Without sample	Assam variety	Assam variety	Chinese variety
Calm	3.12 ± 1.12 ^a	2.46 ± 1.01 ^b	2.46 ± 1.01 ^b	3.16 ± 1.00 ^a
Good	3.18 ± 0.90 ^a	2.34 ± 1.14 ^b	2.34 ± 1.14 ^b	3.20 ± 0.93 ^a
Good-nature	3.58 ± 1.16 ^a	3.10 ± 1.23 ^b	3.10 ± 1.23 ^b	3.56 ± 0.95 ^a
Happy	3.12 ± 0.87 ^a	2.14 ± 1.18 ^b	2.14 ± 1.18 ^b	3.12 ± 1.02 ^a
Peaceful	3.52 ± 0.86 ^a	2.60 ± 1.31 ^b	2.60 ± 1.31 ^b	3.28 ± 1.14 ^a
Pleasant	3.28 ± 0.86 ^a	2.32 ± 1.30 ^b	2.32 ± 1.30 ^b	3.10 ± 1.13 ^a
Tender	2.78 ± 1.00 ^a	2.08 ± 1.14 ^b	2.08 ± 1.14 ^b	2.80 ± 1.16 ^a
Warm	3.08 ± 1.24 ^b	3.00 ± 1.20 ^b	3.00 ± 1.20 ^b	3.48 ± 1.09 ^a

Means within each row with different letters are significantly different at $p < 0.05$

Principle component analysis (PCA) was used to group emotion terms based on level of correlation that exists among them. PCA biplot as shown in Figure 2, 75.73 % of the variability was emotional term to the first principal component (horizontal axis). The second principal component (vertical axis) accounted for 24.27 % of variability. The PCA result could classify samples into 2 groups according to emotional terms. Before consumption (without sample) and after consumption (Chinese variety) formed one cluster which were similar to each other in clam, good, good-nature, happy, peaceful, pleasant, tender and warm.

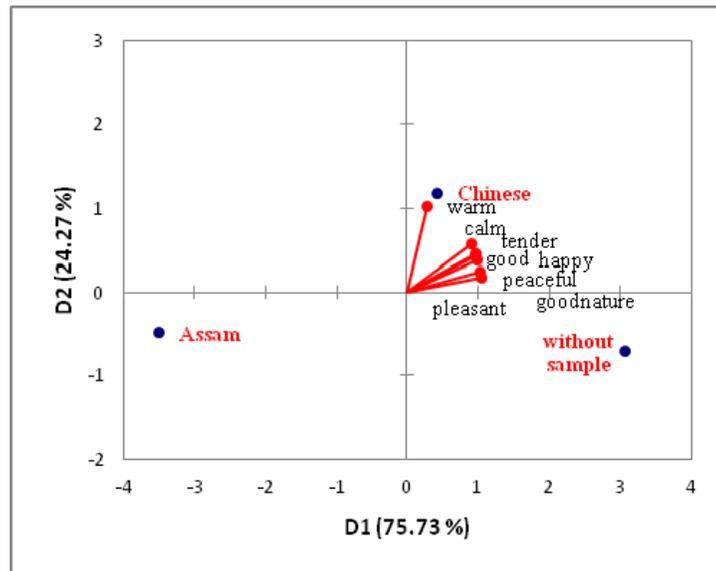


Figure 2. A biplot of the principal component PC1 and PC2, visualizing between before and after consume green tea with various variety and emotional terms.

3.3 Consumer acceptance

Mean sensory score of Thai green tea samples were shown in Tables 3 and 4. Regarding to green tea made from Chinese variety, no differences ($p \geq 0.05$) existed between mean scores of each sample for flavor, taste and overall liking whereas color and aroma were significantly different ($p < 0.05$). Table 5 shows that at least 70 % of consumers accepted Thai green tea made from Chinese Variety. On the other hand, there were differences between Thai green tea made from Assam variety in aroma, flavor, taste and overall liking ($p < 0.05$) whereas color was not significantly difference ($p \geq 0.05$). For purchase intent, Indonesia people decided to buy green tea made from Chinese variety rather than Assam variety due to flavor and taste. Assam variety had strong bitter taste than Chinese variety. Furthermore, it was found that high score of emotion responses may affect buying decision. From previous study [8] mentioned that there is a correlation between overall acceptability and emotional terms.

Table 3. Liking score of Chinese variety (n=175)

Sample	Color	Aroma	Flavor ^{ns}	Taste ^{ns}	Overall liking ^{ns}
Ac	5.92 ± 1.85 ^{ab}	5.73 ± 1.40 ^{bc}	5.29 ± 1.65	5.07 ± 1.83	5.37 ± 1.58
Bc	5.42 ± 1.78 ^{bc}	5.41 ± 1.40 ^c	5.37 ± 1.50	5.23 ± 1.75	5.48 ± 1.44
Cc	5.81 ± 1.56 ^{ab}	5.96 ± 1.30 ^{ab}	5.71 ± 1.57	5.42 ± 1.67	5.74 ± 1.53
Dc	5.80 ± 1.58 ^{ab}	6.27 ± 1.44 ^a	5.43 ± 1.71	5.27 ± 1.84	5.56 ± 1.56
Ec	5.92 ± 1.43 ^{ab}	5.72 ± 1.56 ^{bc}	5.52 ± 1.76	5.25 ± 1.79	5.50 ± 1.68
Fc	6.01 ± 1.42 ^a	5.94 ± 1.38 ^{ab}	5.66 ± 1.62	5.55 ± 1.81	5.75 ± 1.57
Gc	5.28 ± 1.73 ^c	5.62 ± 1.37 ^{bc}	5.66 ± 1.44	5.70 ± 1.51	5.58 ± 1.38

Means within each column with different letters are significantly different at $p < 0.05$
 ns = not significantly different at $p \geq 0.05$

Table 4. Liking score of Assam variety (n=175)

Sample	Color ^{ns}	Aroma	Flavor	Taste	Overall liking
Aa	5.94 ± 1.46	6.09 ± 1.30 ^a	4.97 ± 1.80 ^b	4.71 ± 1.81 ^b	5.12 ± 1.62 ^{bc}
Ba	5.37 ± 1.64	5.46 ± 1.46 ^b	3.59 ± 1.55 ^c	2.98 ± 1.46 ^c	3.64 ± 1.36 ^d
Ca	5.62 ± 1.71	5.04 ± 1.71 ^c	3.25 ± 1.55 ^c	2.73 ± 1.34 ^c	3.22 ± 1.54 ^d
Da	5.81 ± 1.57	6.07 ± 1.16 ^a	5.68 ± 1.56 ^a	5.55 ± 1.70 ^a	5.80 ± 1.44 ^a
Ea	5.94 ± 1.68	5.60 ± 1.80 ^b	4.71 ± 1.99 ^b	4.29 ± 2.05 ^b	4.76 ± 1.89 ^c
Fa	5.94 ± 1.51	6.10 ± 1.39 ^a	5.20 ± 1.58 ^b	4.69 ± 1.80 ^b	5.29 ± 1.49 ^b
Ga	5.85 ± 1.73	6.02 ± 1.48 ^a	4.91 ± 1.60 ^b	4.50 ± 1.64 ^b	4.85 ± 1.49 ^{bc}

Means within each column with different letters are significantly different at $p < 0.05$

Table 5. Overall acceptance and purchase intent of Thai green tea made from various variety

Variety	Sample	Overall acceptance(%)	Purchase decision(%)
Chinese	Ac	60	40
	Bc	70	42
	Cc	77	51
	Dc	71	46
	Ec	75	52
	Fc	70	46
	Gc	76	54
Assam	Aa	63	36
	Ba	78	59
	Ca	25	11
	Da	60	32
	Ea	52	34
	Fa	63	37
	Ga	24	6

Table 6. Logistic regression statistic of Chinese and Assam variety

Factors	Sensory attributes	P-value		Exp (B)	
		Chinese variety	Assam variety	Chinese variety	Assam variety
Overall acceptance	Color	0.002*	0.011*	0.780	0.818
	Aroma	0.085	0.000*	0.844	0.720
	Flavor	0.474	0.009*	0.920	0.764
	Taste	0.000*	0.000*	0.344	0.357
Purchase intent	Color	0.000*	0.006*	0.742	0.794
	Aroma	0.398	0.085	0.924	0.833
	Flavor	0.001*	0.014*	0.677	0.734
	Taste	0.000*	0.000*	0.413	0.387

The logistic regression analysis (LRA) was used to identify sensory attributes that influenced overall acceptance and purchase intent of Thai tea product (Table 6). Result from logistic regression indicated that color and taste were influential attributes affecting overall acceptance ($p < 0.05$) for green tea (Chinese variety) whereas color, aroma, flavor and taste were influential attributes for Assam variety ($p < 0.05$). Indonesian people considered color, flavor and taste as key attributes affecting purchase intent of Thai tea. Furthermore, the Exp (B) value of the color and taste of Chinese variety was 0.780 and 0.344 respectively. It was implied that a one unit liking score in color and taste increased, the product acceptable were increase 0.780 and 0.344 time. While all attributes of Assam variety should be improved to increase product acceptable. From focus group discussion, consumer said that Assam variety had strong bitter taste than Chinese variety. Furthermore, it was found that lower acceptance score affected lower buying decision. It may imply that Indonesia people accepted green tea made from Chinese variety more than Assam variety.

4. Conclusions

This study was demonstrated that Indonesian people's expressing emotional terms on Thai tea products were related to tea variety. Different tea variety had different taste that affect acceptability and purchase intent.

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