



The Development of Cereal Bars with Dried Anchovy for Chinese Customer Using Check All That Apply (CATA) Analysis for Liking and Disliking

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Abstract

Today, energy bars are consumed not only as snacks but also as meal replacement foods. Convenience and nutritional supplementation are the main factors accounting for the increasing use of energy bars. Two hundred Chinese customers who attended the China Fisheries & Seafood Exposition in China, and had no inhibitions about consuming cereal bars were selected. The questionnaire was composed of CATA choices that selected both the reasons for liking and disliking four different types of cereal bars, namely *topokki* flavor (hot pepper paste), seaweed flavor, *kimchi* flavor, and ginseng flavor cereal bars with 10% of dried anchovy content produced by BadaOne Co. (Seoul, Korea). The purpose of the study was to investigate Chinese consumer's attitudes and acceptance of different flavored cereal bars containing protein and calcium-rich anchovy. For the selected Chinese customers, the acceptance score for the seaweed flavor was the highest, followed by *topokki*, red ginseng, and *kimchi*. The acceptance for the *topokki* flavor was higher than for seaweed for the attributes of color except for general acceptance, flavor, aroma, and texture. The results of the survey showed that the acceptance of *kimchi* was the lowest, contrary to earlier predictions. The results of the Check All That Apply (CATA) analysis showed that the reasons for liking the seaweed & anchovy flavor were the most diverse, and there was no reason chosen for disliking this flavor. The reasons for liking this flavor were listed as sweet flavor, healthy, seafood flavor, malty flavor, texture, new/unique, and umami. In the case of *topokki* and *kimchi*, the reason for disliking the flavor was umami, and in the case of red ginseng, the ginseng flavor was the reason for both likes and dislikes. CA analysis showed that both the flavor and emotional factors were positive for seaweed & anchovy and *topokki*, but negative for red ginseng. As a result, seaweed & anchovy flavor, which is familiar to the Chinese people, should be the first cereal bar considered for a launch.

Key Words : Development of cereal bar, CATA, chinese customer, korean-styled seasoning, anchovy

1. Introduction

Cereal bars are a type of small bar snack as a substitute for nutritional breakfast for the pretty modern people, and continues to grow in a company through the purchasing desire of consumers (Lee 2020). Cereal bar is made with a variety of dried fruit and nuts, and marshmallow-based binder; and various products with functional ingredients, such as protein, dietary fiber, and probiotic, are sold in the market (Gutkoski et al. 2007; Ryland et al. 2010; Lobato et al. 2012; Lee et al. 2015; Park et al. 2020). The growth factor of the snack bar market is convenience, ease of energy supply due to sugar used as a binder. In addition, simplicity and portability are the most important (Park et al. 2020). Cereal bar used as meal replacement or supplements for

those who control their diet for weight loss or exercise, as well as for the general public (Brito et al. 2013; Sung et al. 2014). As well as nutritional property and convenience, sensory attributes are important characteristics in determining the acceptability of food (Lobato et al. 2012). Cereal bar is the favorite food for consumers, because of its low volume and weight, and portability (Lobato et al. 2012; Silva et al. 2013). China, one of the largest consumers of multinational food bar products, eventhough in the US and Japan are smaller in market size, about 68% from 23.6 million dollars in 2011 to 39.6 million dollars in 2015 comparing 41 billion KRW of Korean market, it has grown by nearly 20% (Chemical News 2019).

The Chinese are paying attention to food intake for health, as disposable income increases with high economic growth,

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and the importance of green food consumption is recognized (Zhu et al. 2013). It is practical and easy to prepare and consume, making it an emergency food option (Sunyoto et al. 2019). The Chinese middle class, which will increase by 0.3 billion by 2020, recognizes that seafood is healthier than animal protein (Xu et al. 2012). The increase in the demand for seafood naturally leads to the consumption desire for processed seafood. While there is a lot of processed seafood in the seaweed and fish jerky market in the Chinese market (Kim et al. 2016). There are not enough calcium- and protein-rich anchovy processed products. In particular, anchovy contains a large amount of essential amino acids and calcium, and calcium is an important factor in the formation of bones and teeth, and contributes to reducing the risk of osteoporosis, so that both men and women need adequate intake (Lee et al. 2015; Weber et al. 2017). The WHO International Institute for Cancer Research (IARC) reported that calcium intake could lower the risk of cancer from processed meat or red meat, and calcium intake is a very important factor in maintaining good health, as it was even mentioned that it is effective to consume enough calcium to reduce the risk of carcinogenesis in processed meat or red meat (IARC 2015). As the intake of processed foods increases, ingesting calcium, which is prone to being deficient in the body, is very important for all ages. However, the United Nations Food and Agriculture Organization (FAO) survey found that although calcium intake was improved through the intake of dairy products, in China it was still low. The check-all-that-apply (CATA) method is widely used to investigate sensory perception. It is relatively low cost and time saving, and compared to descriptive analysis, can obtain rapid responses from consumers (Valentin et al. 2012; Varela & Ares 2012). Because this methodology can collect intuitive responses, several authors have used CATA methodology with consumers to characterize the sensory properties of foods/beverages such as cheese (Meyners 2016), ice cream (Dooley et al. 2010), soymilk (Hwang & Hong 2015) and various food textures (Kim & Lee 2016). And found it to be easy and quick, while yielding product characterizations that are similar to those obtained by descriptive sensory analysis.

In this study, Chinese consumer attitudes and acceptance of cereal bars with different flavor after adding protein and calcium rich anchovy were investigated. In addition, the consumer-friendly Check All That Apply (CATA) method was used to investigate the reasons for consumers liking or disliking products (Alcaire et al. 2017). The results of this

study could be used as basic data for the development of calcium- and protein-enhanced cereal bars for Chinese consumers in the future.

II. Materials and Methods

1. Samples

The samples used in the consumer acceptance survey are the *topokki* flavor (hot pepper paste), seaweed flavor, *kimchi* flavor, and ginseng flavor by SIAS CO., LTD, cereal bars with 10% of dried anchovy content produced by BadaOne Co. (Seoul, Korea). In all sample, 40% brown, 10% dried anchovy, 17% various nuts and 5% dried cranberry were used in the same way. Oligosaccharides and sugars were used as binding agents, and flavor powder was mixed with vegetable oil to enhance the flavor. <Table 1> shows the material composition of each sample. All samples were stored at room temperature (18°C), and then samples of 1.5 cm height×3 cm width×1.5 cm length in a 100 mL capacity opaque plastic cup were randomly provided per panel. Bottled water stored at room temperature was provided to rinse the mouth when evaluating the sample. This study was conducted with the approval of the Institutional Review Board of Kongju National University (IRB No.: IRB_2016-69).

2. Investigation contents

The consumption experience and attitude survey questions of processed seafood in Chinese consumers was developed based on Refs (Bae et al. 2013; Jeon et al. 2016). Demographic questions of age, marital status, and exposition participation type were composed of 7 items of nominal scale, 5 questions about attitude and intention, and flavor specific product acceptance was composed of a 7-point Likert scale (1: dislike extremely, 7: like extremely). The questionnaire was composed of CATA answers that selected both the liking and disliking reasons for each sample. The items on the CATA questionnaire were collected by interviewing focus groups of eight trained domestic consumers. The completed questionnaire was first translated by experts into the Chinese language, secondly translated into Korean by a Korean language major in China, then re-translated into Chinese, and cross-checked.

3. Survey period and panel selection

This survey was conducted from November 2nd to 4th, 2016 at the Korea Pavilion and BadaOne Co. booth of the

<Table 1> Formulas for cereal bar with different flavor

(Units:%)

Ingredients	Samples			
	<i>Topokki</i> Flavor	Seaweed Flavor	<i>Kimchi</i> Flavor	Ginseng Flavor
Brown rice flakes			40	
Dried anchovy			10	
Oligosaccharides			16	
Sugar			4	
Dried cranberry			5	
Almond Power			5	
Slice Almond			7	
Cashew nut			5	
Vegetable oil			3	
Seasoning ¹⁾	<i>Topokki</i> Flavor powder	5		
	Seaweed Flavor powder		5	
	<i>Kimchi</i> Flavor powder			5
	Ginseng Flavor powder			5
Total	100	100	100	100

The *topokki* flavor (hot pepper paste), seaweed flavor, *kimchi* flavor, and ginseng flavor by SIAS Co., Ltd.

China Fisheries & Seafood Exposition, on visitors visiting the exposition in China. The contents of the survey were explained by a professional interpreter in the Chinese language, so that the consumer panel was fully informed. The scale used for the test was 7 points: the lower the score, the lower the acceptance, and the higher the score, the higher the acceptance (1: dislike extremely; 7: like extremely). Up to 20 consumer panelists participated in each test, which took approximately 20 minutes. The subject of this test was therefore 200 Chinese who attended the exposition in the age range of their (20-60), and the panelists were selected from consumers without repulsion to cereal bars. Statistical analysis was conducted on 158 subjects (response rate: 79%) except for unfaithful answers.

4. Statistical analysis

Consumer acceptance investigation results were analyzed using Statistics Package for the Social Science (SPSS), Ver. 19.0 for Window, and acceptance and attitude item responses were expressed as mean±SD. Demographic characteristics were frequency analyzed, and analysis of variance (ANOVA) and *t*-test were performed to see if there was a significant difference between the consumer groups, with Duncan's multiple range test being performed to determine significance ($\alpha=0.05$). To identify the reason of liking and disliking, frequency analysis was conducted by counting the number of panelists that checked that term to describe each sample.

Chi-square test among the samples was used to evaluate the significance.

Correspondence analysis (CA) was performed using XLSTAT (Evaluation 18.06, Addinsoft, USA) to tabulate the reasons for liking and reasons for disliking the sample by consumers, and the results was described on symmetric plot. Correspondence analysis (CA) was conducted by selecting 20% terms that have a high frequency of affecting consumer acceptance.

III. Results

1. Demographic characteristics

Among the 200 subjects surveyed, the investigation was performed on 158 valid subjects (valid response rate: 79%), who consisted of 38% men and 62% women. The total average age was 31 years, 38.6% were in their 20s, 43.6% were in their 30s, and 17.8% were in their 40s or older. For marital status, there were 58.9% married, and 41.1% unmarried subjects. For occupations of the subjects, sales and technical jobs accounted for 38%, clerks and store managers accounted for 16.5% each, students and homemakers accounted for 15%, and professionals, such as public officials, accounted for 13.9%. For the educational status of subjects, Attendance/completed college was the highest with 64%, and attended/completed college was 22.8%. In the case of one monthly income, 29.1% earned less than 5,000 RMB

<Table 2> Socio-Demographic profiles of the subjects participating in the study

		20s	30s	<40s	Total
		Frequency (%)			
Gender	Male	14 (23.0) ¹⁾	30 (43.5)	16 (57.1)	60 (38.0)
	Female	47 (77.0)	39 (56.5)	12 (42.9)	98 (62.0)
Age		61 (38.6)	69 (43.6%)	28 (17.8)	158 (100)
	Average	24.02±3.12 ²⁾	32.46±2.58	44.86±4.80	31.39±8.03
Marriage	Married	12 (19.7)	55 (79.7)	26 (92.9)	93 (58.9)
	Single	49 (80.3)	14 (20.3)	2 (7.1)	65 (41.1)
Occupation	Public official & Professional	10 (16.4)	8 (11.6)	4 (14.3)	22 (13.9)
	Clerk · manager	9 (14.8)	15 (21.7)	2 (7.1)	26 (16.5)
	Sales · service & Engineer	19 (31.1)	31 (45.0)	10 (35.7)	60 (38.0)
	Self-employed	2 (3.3)	13 (18.8)	11 (39.3)	26 (16.5)
	Student & Homemaker	21 (34.4)	2 (2.9)	1 (3.6)	24 (15.1)
Educational Status	Less than elementary school	0 (0.0)	0 (0.0)	2 (7.1)	2 (1.2)
	Middle school	0 (0.0)	3 (4.3)	2 (7.1)	5 (3.1)
	High school	2 (3.3)	9 (13.0)	3 (10.7)	14 (8.9)
	Attended/completed college	12 (19.7)	15 (21.7)	9 (32.1)	36 (22.8)
	Attended/completed university	36 (59.0)	34 (49.4)	11 (39.4)	81 (51.3)
	Attended/completed graduate school	11 (18.0)	8 (11.6)	1 (3.6)	20 (12.7)
Family income	Low ³⁾	31 (50.8)	11 (15.9)	4 (14.2)	46 (29.1)
	Middle	22 (36.1)	33 (47.8)	12 (42.9)	67 (42.4)
	High	8 (13.1)	25 (36.3)	12 (42.9)	45 (28.5)
Qualification	Distributor	16 (26.2)	38 (55.1)	20 (7.14)	74 (46.8)
	General visitor	45 (73.8)	31 (44.9)	8 (28.6)	84 (53.2)
Total		61 (38.6)	69 (43.6)	28 (17.8)	158 (100.0)

¹⁾N(%)

²⁾mean±SD

³⁾Low: average salary for month <5,000元, Middle: 5,000元 ≤ average salary for month <10,000元, High: average salary for month ≥ 10,000元

(about 850,000 won per month), 42.4% earned (5,000-10,000) RMB, and 28.5% earned over 10,000 RMB, which was the high group. Among the subjects surveyed, 46.8% were buyers, and 53.2% were general consumers <Table 2>.

2. Cereal bar acceptance and degree of balance by products

The acceptance score for seaweed flavor was highest, and then it was in the order of *topokki*, red ginseng, and *kimchi* <Table 3>. In the case of color except for general acceptance, flavor, aroma, and texture, the acceptance for *topokki* flavor was higher than for seaweed. The results of the survey showed that the acceptance for *kimchi* was the lowest, unlike the predictions. As it is known in Korea, *kimchi* was expected to have high acceptance in China as a representative Korean food, but the distinctive dry smell and strong flavor of dried *kimchi* seem to have had a bad influence on flavor.

In some previous studies, Chinese people unexpectedly did not prefer original Korean seasonings and *kimchi* flavor (Kweon & Yoon 2006; Park et al. 2016).

In balance of flavor, there was a significant difference between samples, and the balance of the flavor of seaweed was the best. The balance of each ingredient was also found to be the best in the balance of the flavor of seaweed. As the function of seaweed has become more remarkable, seaweed food choices were increased by the Chinese (Fleurence 1999). And seaweed is perceived as snack food which can be easily enjoyed by Chinese people unlike Korea people.

3. CATA analysis on the cereal bar

<Table 4> shows the results of CATA analysis on the reason for liking and disliking According to the sample. The responses of the CATA terms to the samples were subjected to a Chi-square test. As a result of Chi-square, in *topokki*

<Table 3> Acceptance score and degree of balance of cereal bars

	<i>Topokki</i> Flavor	Seaweed Flavor	<i>Kimchi</i> Flavor	Ginseng Flavor	F
Overall liking	5.11±1.41 ^{1)B2)}	5.60±1.42 ^A	4.68±1.62 ^C	5.03±1.61 ^B	7.07*** ³⁾
Flavor liking	5.03±1.58 ^B	5.57±1.41 ^A	4.71±1.58 ^B	4.91±1.67 ^B	6.436***
Aroma liking	5.15±1.39 ^B	5.55±1.41 ^A	4.77±1.55 ^C	5.04±1.72 ^{BC}	5.505***
Color liking	5.72±1.29 ^A	5.53±1.37 ^{AB}	5.32±1.47 ^B	5.29±1.57 ^B	2.567*
Texture liking	5.34±1.39 ^{AB}	5.56±1.37 ^A	5.01±1.53 ^B	5.23±1.60 ^{AB}	2.839*
Balance of flavor	5.09±1.47 ^B	5.55±1.44 ^A	4.91±1.54 ^B	4.97±1.64 ^B	4.258**
Degree of balance for each ingredient	5.13±1.39 ^B	5.61±1.39 ^A	4.96±1.55 ^B	4.96±1.71 ^B	4.785**

¹⁾7-point hedonic scale (1='dislike extremely', and 7='like extremely'), mean±SD

²⁾A-C: Means with the same superscript in a row are significantly different at p<0.05

³⁾*p<0.05, **p<0.01, ***p<0.001

<Table 4> Reasons¹⁾ for liking and disliking cereal bar (CATA analysis)

	<i>Topokki</i> Flavor	Seaweed Flavor	<i>Kimchi</i> Flavor	Ginseng Flavor
Reason for liking	Sweet flavor ²⁾ (45.5) ^{3)***4)}	Sweet flavor (36.6)**	Umami (38.6)***	Sweet flavor (34.9)**
	Salty flavor (16.9)	Salty flavor (21.5)	Pungent/spicy flavor (15.8)***	Malty flavor (20.6)
	Umami (35.1)***	Malty flavor (24.7)	Strong flavor (19.3)***	Red ginseng aroma (41.3)***
	Malty flavor (27.3)	Seafood flavor (30.1)***	Texture (17.5)	Rich afterflavor (19.0)
	Pungent/spicy flavor (22.1)***	Seafood odor (19.4)*	New/unique (29.8)	New/unique (19.0)
	Texture (26.0)	Mild flavor (21.5)**	Healthy (15.8)	Healthy (25.4)
	Rich afterflavor (19.5)	Texture (23.7)	Satisfying (19.3)	Betters my mood (15.9)
	Neat afterflavor (15.6)**	Rich afterflavor (20.4)		Satisfying (19.0)
	New/unique (36.4)	Neat afterflavor (21.5)**		
	Healthy (19.5)	Like with no particular reason (17.2)		
	Betters my mood (20.8)	Familiar (18.3)		
	Want to eat more (15.6)	New/unique (22.6)		
	Satisfying (31.2)	Healthy (33.3)		
		Betters my mood (15.1)		
	Satisfying (32.3)			
Reason for disliking	<i>Topokki</i> Flavor	Seaweed Flavor	<i>Kimchi</i> Flavor	Ginseng Flavor
	Umami (24.6)***	None (51.8)	Umami (23.5)***	Bitter flavor (17.9)***
	None (39.1)		Residual feel in the mouth (20.6)	Red ginseng aroma (27.4)***
		None (30.9)	None (31.0)	

¹⁾Multiple choice

²⁾Attributes selected by more than 20% of the subjects are listed

³⁾Numbers in the parenthesis are the percentage of respondents who checked the attributes

⁴⁾*p<0.05, **p<0.01, ***p<0.001

flavor, sweet and pungent/spicy flavors showed p-values less than 0.01, umami and neat after flavor showed a significance less than 0.001. In the seaweed flavor, seafood odor showed a p<0.05 value, sweet flavor and neat after flavor were p<0.01, seafood and mild flavors showed a significant p<0.001. In addition, the *kimchi* flavor product was significant with a p value of less than 0.001 along with the umami, pungent/spicy flavors and strong flavor. And ginseng flavor of p<0.01 and sweet ginseng aroma of p<0.001 were significant. In the reason for disliking, umami was significant at *topokki* flavor and *kimchi* flavor with p<0.001, in the

ginseng flavor, bitter flavor and red ginseng aroma showed a significance of p<0.001.

The reasons for liking the *topokki* flavor were sweet flavor, new/unique, umami, satisfying, and malty flavor. The reasons for liking the seaweed flavor were the most, and in the order of sweet flavor, healthy, seafood flavor, malty flavor, texture, new/unique, umami, et al. In the case of *kimchi* flavor, the reasons for liking were umami and new/unique. In the case of ginseng flavor, red ginseng aroma and sweet flavor, healthiness, and malty flavor were the reasons for liking. New/unique has been investigated as a common

liking reason for all products, since cereal bar products have not been activated in the Chinese market.

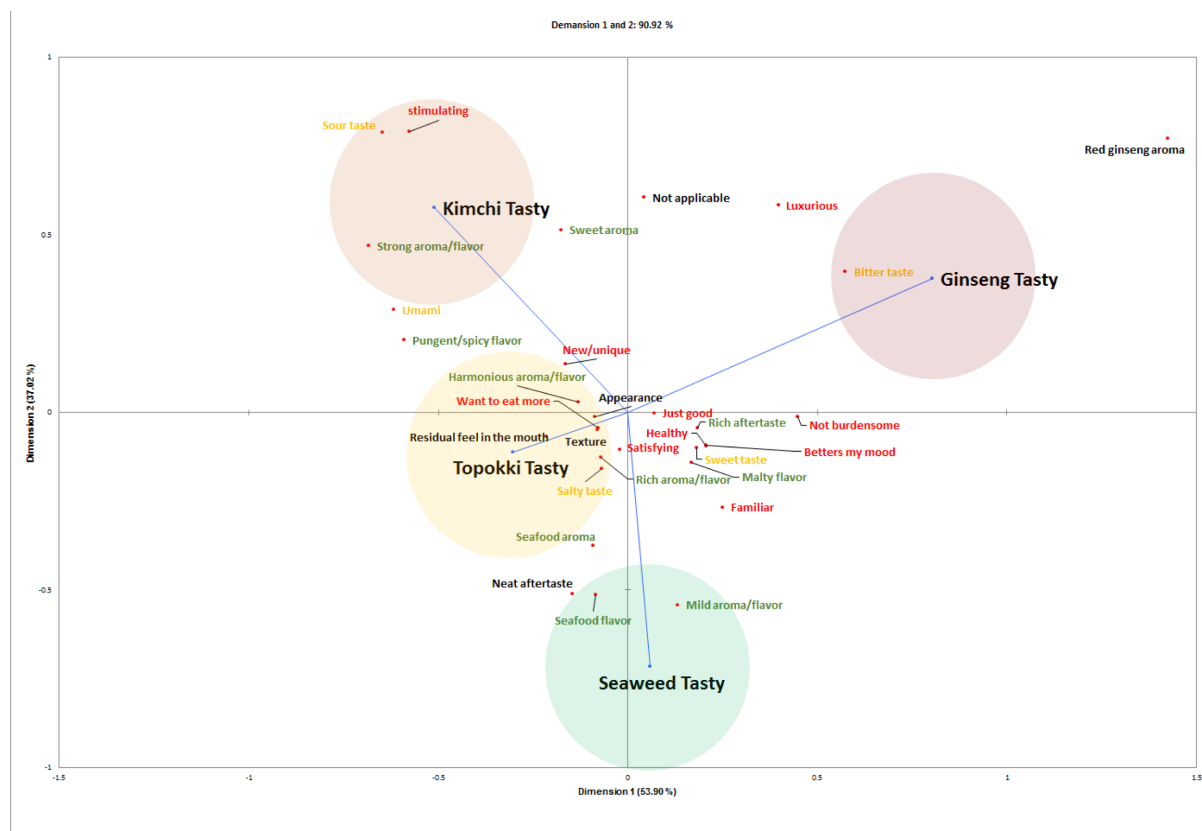
The reasons for disliking were relatively few. In the case of *topokki* flavor and *kimchi* flavor, umami was, and in the case of red ginseng, the ginseng flavor was the reason for disliking. The abundance of umami of anchovy caused both of personal liking and disliking acceptance. Ginseng is a functional food known worldwide for its efficacy, and the consumption promotion in China of ginseng has started (Kweon & Yoon 2006). Consumer survey showed that there is a significant difference in acceptance for red ginseng products among Chinese consumers. The fact that there was no reason to dislike the seaweed flavor, which had the highest acceptance for Chinese people, was unusual. The reason for this is thought to be that various snacks using seaweed are consumed in China. In particular, Chinese people prefer seasoned seaweed, which is consistent with the high liking of cereal bar with added seaweed flavor (Kim et al. 2016).

4. CA analysis on cereal bar

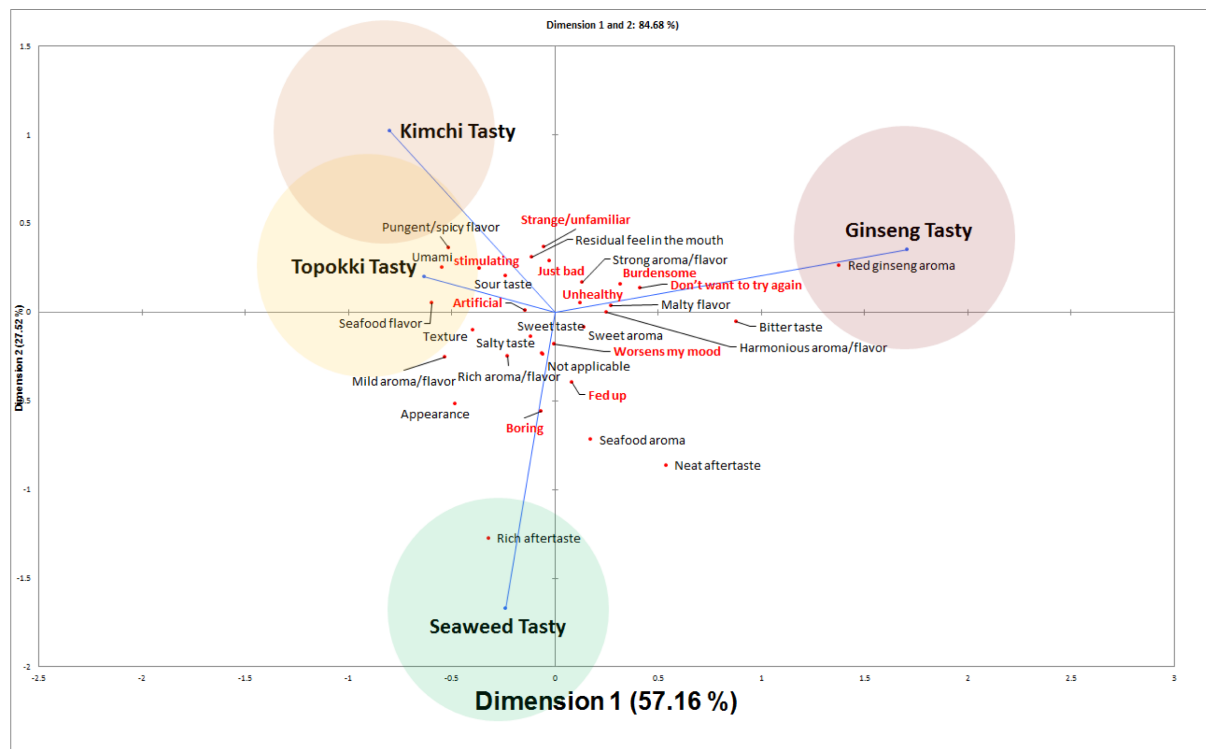
First, the items whose response rate per sample is more than 20% are as follows. The reasons for liking the *topokki*

flavor were sweet flavor, new/unique, umami, satisfying, and malty flavor. The reasons for liking the seaweed flavor were the most, and in the order of sweet flavor, healthy, seafood flavor, malty flavor, texture, new/unique, umami, et al. In the case of *kimchi* flavor, the reasons for liking were umami and new/unique. Finally, ginseng flavor, red ginseng aroma and sweet flavor, healthiness, and malty flavor were the reasons for liking. New/unique has been investigated as a common liking reason for all products, since cereal bar products have not been activated in the Chinese market.

The reasons for disliking were relatively few. In the case of *topokki* flavor and *kimchi* flavor, umami was, and in the case of red ginseng, the ginseng flavor was the reason for disliking. Ginseng is a functional food known worldwide for its efficacy, and the consumption promotion in China of ginseng has started (Kweon & Yoon 2006). Consumer survey showed that there is a significant difference in acceptance for red ginseng products among Chinese consumers. That is, even if a functional material is added, the preference is not high when the recognition is low on the product type itself like cereal bar. This is because most consumers are willing to consume familiar products that they already know rather than new products. A familiar food item may be chosen



<Figure 1> Schematization for liking of cereal bar by correspondence analysis (CA)



<Figure 2> Schematization for disliking of cereal bar by correspondence analysis (CA)

more often through force of habit, and a novel food may be avoided due to a general conservative tendency towards novel foods (Arvola & Tuorila 1999). The fact that there was no reason to dislike the seaweed flavor, which had the highest acceptance for Chinese people, was unusual. The reason for this is thought to be that various snacks using seaweed are consumed in China. In particular, Chinese people prefer seasoned seaweed, which is consistent with the high liking of cereal bar with added seaweed flavor (Kim et al. 2016).

<Figure 1> shows the results of CA analysis on the reasons for liking additive materials. Axes 1 and 2 account for (53.90 and 37.02)% of the variation, respectively, accounting for 90.92% of the total variation. For axis 1, stimulating, strong, and sour flavor were loaded in the negative direction, while healthy, bitter flavor, rich after flavor, and bitter flavor were loaded in the positive direction. For axis 2, seafood flavor, mild flavor, and malty flavor were loaded in the negative direction, while stimulating, red ginseng flavor, and luxurious were loaded in the positive direction. High liking of seaweed flavor and *topokki* flavor was located in the negative direction of axis 2, while *kimchi* flavor and ginseng flavor were located in the positive direction of axis 2. The preferred reasons for *kimchi* flavor were related to strong flavor, stimulating, sour flavor, and

pungent/spicy flavor, while the acceptance for *topokki* flavor was associated with flavor elements, such as rich flavor, harmonious flavor, and salty flavor, appearance, texture, residual feel in the mouth, not burdensome, and new/unique. For seaweed flavor, acceptance was found to be related to seafood flavor, mild flavor, and neat after flavor. In the case of seaweed, seaweed is widely consumed in China, and various snacks are sold and consumed, which explains the highest acceptance, and it is thought that they recognize it as a mild flavor. For ginseng flavor products, bitter flavor was found to be related to acceptance, and it had the lowest acceptance among products.

<Figure 2> shows the results of the reason for disliking according to additive materials. Axes 1 and 2 account for (57.16 and 27.52)% of the variance respectively, accounting for 84.68% of the total variation. In axis 1, seafood flavor, pungent flavor, stimulating, and artificial flavor were loaded in the negative direction, while negative factors, such as bitter flavor, do not want to try, and burdensome, were loaded in the positive direction. In axis 2, negative factors, such as residual feel in the mouth, strong flavor, strange, and unfamiliar were loaded in the positive direction, while positive factors, such as seafood flavor, rich flavor and neat after flavor, were loaded in the negative direction. All *kimchi*, *topokki*, and seaweed flavor products, except ginseng

products, were located in the negative direction of axis 1, while seaweed flavor was located in the negative direction of axis 2. In other words, *kimchi*, *topokki*, and ginseng were located in negative factors, such as just bad, burdensome, do not want to try, and unhealthy; and pre-existing negative factors are thought to be related to disliking in consumers. Especially, in case of ginseng flavor, unlike other products, red ginseng flavor was associated with reason for disliking. In fact, when applying ginseng products to product development in Korea, there were differences according to gender, and 67.3% of the female respondents responded that they did not eat due to bad flavor, and it was also found to have high strong liking and disliking in palatability (Kim et al. 2012).

Since Chinese consumer awareness of health, safety, and nutrition has increased recently, it is expected that products rich in protein and calcium can appeal to consumers in the market. As a result of this study, it is determined that it would be better to sell seaweed flavor and *topokki* flavor product with higher acceptance on the Chinese market. The CATA method used in this study can directly confirm the reasons for consumer liking and disliking, and the results can be used as basic data for the development of various processed seafood in China, which can supplement calcium and protein.

IV. Discussion

For Chinese customers, the overall acceptance among the cereal bars with Korean-styled seasoning, *topokki*, seaweed & anchovy, *kimchi*, and red ginseng, seaweed & anchovy flavorings was the highest, while *topokki*, *kimchi*, and red ginseng were the next in order ($p < 0.001$). As a result of the research, the recognition of the product is important, and even if the known functional material is added during the product development, it cannot be selected by consumers if the perception of the product itself is low. Actual cereal bars differ in perception and use of products by country, as perceived as a substitute for meals in the United States and snacks in Korea. For Chinese people, cereal bars are not well known, so it will be necessary to improve their awareness in future product development. As a result, seaweed & anchovy flavor, which is familiar to Chinese people, should be the first cereal bar considered to be launched.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Received May 25, 2021; revised June 16, 2021; accepted June 18, 2021