



Research Article

A Decision Support System for Consumer Behavior of Chinese In-bound Tourists on Functional Beverage: An Empirical Study during COVID-19 with Thailand Sandbox

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Abstract

The COVID-19 pandemic has challenged all business owners to maintain their businesses and find ways to cope with the uncertainty. The functional beverage market has shifted its focus to consumers' health value and wellness while its operators still lack knowledge to develop their products to serve customer needs, particularly to penetrate new customer groups, which are tourists. Therefore, the objective of this research is to investigate major influential factors of consumer behavior and create a decision support system (DSS) of consumer behavior (CB) on functional beverage. Samples are 378 Chinese tourists who visited Thailand in 2019 before the COVID-19 outbreak. The structural equation modeling (SEM) was employed to analyze the data while the sensitivity analysis was to test model robustness. The results showed that motivation, reference group, and knowledge have indirectly influenced CB (buying behavior, brand consciousness, health consciousness, and quality consciousness) through Marketing Mix (MM) while MM has a direct influence on CB. Moreover, sensitivity analysis expressed that either increasing or decreasing place and decreasing knowledge can influence CB factors. These results confirmed that consumers in the new normal market were interested in brands, quality, and health; therefore, brand consciousness/brand creation was a crucial challenge for small and medium-sized enterprises (SMEs) in the industry as they needed to improve product quality and be informative in terms of products' health benefits. Hence, SMEs had to develop the product serving customer needs, gaining competitive advantages, and boosting up the economic cycle of the whole tourism supply chain from Thailand's sandbox project. The value of DSS can help entrepreneurs decide to produce beverage to meet Chinese tourists' satisfaction and to save cost for product development. It is an applicable tool for entrepreneurs, chiefly SMEs, to penetrate a new tourism market and choose a new suitable product that serves consumer needs in terms of tastes, brand awareness, and health benefits in the post-pandemic era.

Keywords: Functional beverage, Decision support system, Structural Equation Modeling (SEM), Consumer behavior, Hospitality industry

1 Introduction

According to the World Trade Organization (WTO), the COVID-19 pandemic precipitates the world's most devastating financial crisis. Initially, WTO estimated that the world's GDP (Gross Domestic Product) of 2020 would potentially drop by approximately 2.4 to 3.0 percent [1]. This crisis has challenged all business owners to maintain their businesses and find effective ways to survive the uncertainty [2]. Those businesses that could not adapt their business models to the current situation have been losing or closing their businesses while the others who managed to do the opposite can survive.

The hospitality industry contributes to a large number of employment opportunities throughout the whole supply chain and drives fast economic growth. The major sectors in the hospitality industry are tourism and food and beverages. Food and beverage entrepreneurs need to adapt themselves to cope with technological changes, innovations, global trends, and the popularity of healthcare due to the technological advancements, leading to important changes in consumer behaviors.

Food and beverages are the key segment on which tourists have spent their money while functional beverages obtain the largest market share [3]. Functional beverages, which are a supplemental nutrition drink [4], or one that contains additional ingredients that enhance health benefits [5], can reinforce health and strength. This beverage market has its target groups according to some parameters such as age, demographic, and gender. Considerably, target groups of this product category are overlapping as the product has been widely accepted due to preferable taste such as orange, grape, apple flavors, etc. These flavors are refreshing and consumers consider them a natural healthy drink [6]. Consequently, a study of functional beverage market can be considerably complicated to an extent that entrepreneurs require a system to support their decision-making process and help them assess customer satisfaction [7]. As mentioned above, consumer preferences need to be identified [8] before each launch of new products in order to ensure that satisfying sales volume will be achieved.

Chinese tourists are present everywhere throughout the globe including Thailand. There were approximately 10.5 million Chinese tourists in 2018 and highly increased by 27.5% in 2019 [9], contributing to the

largest proportion of tourism revenue (around USD 19,357 million). Furthermore, they led to drastical change in tourist behavior by decreasing their non-food shopping expenses while increasing those spending on local food and beverages. In this regard, functional beverage manufacturers still lack research and development knowledge and are unable to develop beverage tastes that fulfill tourists' preferences. They also need know-how to build brand awareness among the tourists and effective communications to provide information about the benefits of beverages to the tourists.

The COVID-19 pandemic affects billions of lives around the world with tremendous impacts on the global economy and industries, especially small and medium-sized enterprises (SMEs). All of them have to adjust their business strategies to survive in this tragic circumstance. While there are low possibilities in some emerging markets, maintaining the existing customer base is also currently a difficult task to perform. As, SMEs, which have low capital investment, require certain methods to improve their products, business strategies, and production process to achieve customer needs and customer satisfaction, in order to sustain competitive advantages. As mentioned earlier, building a Decision Support System (DSS) of consumer behavior enables SMEs to have an effective tool to help make a decision in order to reduce processes in product development alongside minimizing its costs.

Fortunately, the Thai Government launched Thailand's sandbox project to encourage the tourism industry and attracted foreign tourists, mainly the Chinese ones, in travel bubble countries. This project can be a good economic stimulus package in support of tourism SMEs located in different destinations and is also a good opportunity for the operators to enhance sales volume and launch a new market to capture the tourists. However, there are several pain points that entrepreneurs have to consider and prepare themselves to serve their customers in this new normal era.

Hence as described in objectives, investigation of consumer behavior is necessary in order to classify the factors satisfying the consumers in the development of functional beverages. Both market and academic research have struggled to propose a decision support system as commercial development of beverages is complex and expensive. A gap in empirical academic research on consumer behavior still exists, principally in terms of approach to assess consumer behavior.

Also, the DSS for consumer behavior is barely studied in this industry. DSS is an important tool in the field of industrial engineering, which facilitates decision-making of business operators. This research has applied scientific and technological approaches in order to be able to develop a DSS that is applicable to the social scientific field via an industrial engineering process. In this regard, the scope of journal allows research on this type of applied science. Findings of this research can be used as a guide to enhance the influential factors of consumer behavior, referring to functional beverages; and the decision support system can also help SME entrepreneurs select a method to achieve customer satisfaction, notably that of Chinese tourists who are major buyers. The SME entrepreneurs who operate the functional beverage business can enhance their competitive advantages by using the decision support system.

This research has two objectives which are 1) to investigate the influential factors of consumer behaviors on functional beverages and 2) to construct a decision support system of consumer behavior in purchasing functional beverages.

2 Materials and Methods

This research is focused on factors affecting consumer behavior in order to construct a DSS. This research is undertaken via scientific approaches starting from literature review, research methodology, and data analysis through Structural Equation Modeling (SEM). Afterwards, an applicable DSS is created for entrepreneurs. The system helps them make a decision and improve marketing strategies for their products.

2.1 Consumer behavior

Kotler and Armstrong [10] addressed that there are four main types of factors that have influences on consumer behavior, consisting of marketing stimuli, other stimuli, consumer psychology, and consumer characteristics. The study of Siegrist [11] concluded that consumers buy functional products with physiological and psychological health consciousness. However, online social interaction among consumers can change buying behavior [12]. Normally, the consumer makes a decision on a food product based on brand consciousness or trust in the product. Brand and

quality consciousness have been proved to influence consumer behavior. There are many studies expressing that brand conceptualization can lead to understanding consumer behavior [13]. Thus, brand loyalty and consciousness are strategies to reduce the risk of quality awareness of consumers [14]. Health consciousness is an important component of a consumer's attitude which is increasingly concerned in older adults.

Consequently, buying behavior, brand consciousness, health consciousness, and quality consciousness are considered consumer behavior in this study.

2.2 Consumer characteristics and marketing mix

Feil [15] found that motivation, perception, and product information affected consumer purchasing intention and consumer behavior. Accordingly, motivation to brand selection [16] and reference group affected brand consciousness and purchasing decision [17]. Moreover, Efanny [18] confirmed that marketing mix (product, price, place, and promotion) affected brand consciousness and consumer satisfaction. Nayeem, [19] found that marketing mix affected quality perception of the products and trust to the product and this lead to purchasing decision.

Therefore, consumer characteristics are composed of motivation, reference group, and knowledge while marketing mix is composed of product, price, place, and promotion.

2.3 Structural equation modeling

Structural Equation Modeling (SEM) is a statistical technique for causal relation test and estimation using a combination of statistical data and qualitative causal assumptions. Müller [20] applied the context of SEM into tourism technology and tourist behavior study while Sie [21] applied PLS-SEM to the study of the interrelationship between self-determined motivations, memorable experiences, and overall satisfaction of older Australian tourists. Also, Wang [22] used SEM to analyze some influential factors regarding consumers' attitudes toward price change and adoption.

2.4 Decision support system

Decision Support System (DSS) is a computer programing software that supports a business with an

organizational decision-making model. A DSS can serve the management, operations, and planning levels when making decisions in knowledge-based systems. Pereira [23] expresses that the DSS is an applicable tool to increase consumer satisfaction and consumer confidence. In market research on the purchasing behavior of consumers, the DSS is an appropriate method to determine the essential aspects of consumer behavior [24].

2.5 The new trend of functional beverage market

There are a number of business strategies and business models in functional beverage market as described below. Generally, Bordbia [25] classified the commercial functional beverage for the global adult market into 2 categories which are functional health: nutrification, protection, gut health, immunization, antioxidation, and adaptogens; and functional wellness: sleep, stress, and beauty. However, global current and future trends of the functional beverage remain the same aspect as sweet spot [26]. The future beverages will be sugar-reduced/sugar-free and naturally formulated drinks to improve moods and boost brain health [26]. In addition, consumers pay more attention to consume the functional beverage as it brings health benefits in terms of disease prevention and curative power [27]. The new marketing concept of functional beverage shifts to consumers' health values as the key to purchase intention and attract business by developing practical marketing strategies [28]. Besides, the advertising strategies to generate consumer demands, accelerate consumer purchasing decisions, and increase brand loyalty, are necessarily applied [29]. Then, the entrepreneurs can inform the health benefits of ingredients and promote a healthy beverage for consumer acceptance. Furthermore, classification of the functional beverage, production, ingredients, trends, challenges, and future opportunities are emphasized on the functional product development [30].

Thailand's sandbox project can accelerate the cash flows of the tourism supply chain and the whole GDP where this economic stimulus package aroused the economic cycle. SMEs in functional beverage industry can take benefits by preparing healthy beverage which response to customer needs, publishing the benefits of ingredients, and proposing well-created brand. This is a good opportunity for entrepreneurs in

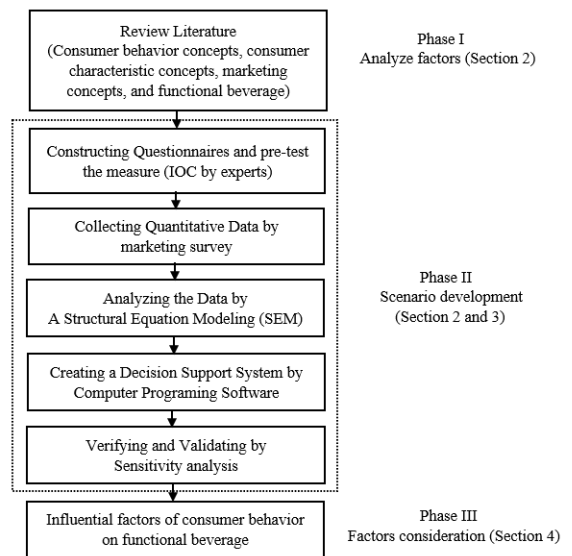


Figure 1: The DSS for consumer behavior on functional beverage.

the functional beverage industry to gain competitive advantages.

2.6 Research methodology

In this section, the DSS is demonstrated in three phases as presented in Figure 1 below. *Phase I: Literature Review*, pieces of research and theories of consumer behavior concepts, consumer characteristic concept, marketing concepts, and functional beverage are studied to identify appropriate factors which could affect consumer behavior referring to functional beverage. There are five steps in *Phase II: Scenario Development*. This phase begins with constructing questionnaires confirmed by experts and pre-testing the measure, then continues with collecting quantitative data by marketing surveys from 378 samples. Then the next step is analyzing the data by SEM, afterwards creating a DSS using computer software. Step is done, and finally the model is verified by using sensitivity analysis tests as the last step.

Firstly, the quantitative survey research is conducted through questionnaires employing Likert scales (5 levels: 1 = strongly disagree and 5 = strongly agree) developed by adapting the possible validated measures or transforming the definitions of constructs.

The pre-test is done using a trial group of 60

members which come from different tourist attractions around Thailand with similar characteristics. A pre-test questionnaire is conducted to examine the content validity. The experts from industry and academic fields are invited to validate with the index of consistency (IOC) technique. Next, the reliability of the factors is tested, showing a high Cronbach's Alpha (α) for consumer behavior (.963), consumer characteristic (.937), and marketing mix (.917). Then, a field study is initiated to collect data from 360 samples from several tourist attractions around Thailand: North, South, East, Northeast, Central, and Bangkok, with plus 5% for errors. Totally, 378 samples will provide 100% collected although SEM analysis requires only 220 samples (11 latent variables \times 20 multiply = 220 samples). Eleven latent variables are motivation, reference group, knowledge, product, price, place, promotion, buying behavior, brand consciousness, health consciousness, and quality consciousness.

Secondly, quantitative data is collected via marketing surveys. Sampling involved a group of Chinese tourists who visited Thailand in the period of October-December 2019 before the COVID-19 emerged.

There are three sections in the questionnaire as following. Section 1 involves general information of the respondent including gender, occupation, age, and education. In section 2 and 3, the respondent has to answer which factors are likely to influence the functional beverage selection decision and is asked to put a short comment on the product respectively using the 5-point Likert scale. Reliability is tested using the Cronbach alpha coefficient (.880).

Then, the data is analyzed by SEM presented and afterwards a DSS is created with computer programming software. Lastly, the computer software model is verified by testing with sensitivity analysis.

Phase III: Factors consideration expresses the influential factors of consumer behavior on functional beverage. This concludes which factors affect consumer behavior and presents an addition to the sensitivity analysis. This is crucial to an entrepreneur to apply the influential factors for the product strategy.

3 Results and Discussion

3.1 Constructing questionnaires and pre-testing

The questionnaires are developed upon the experts'

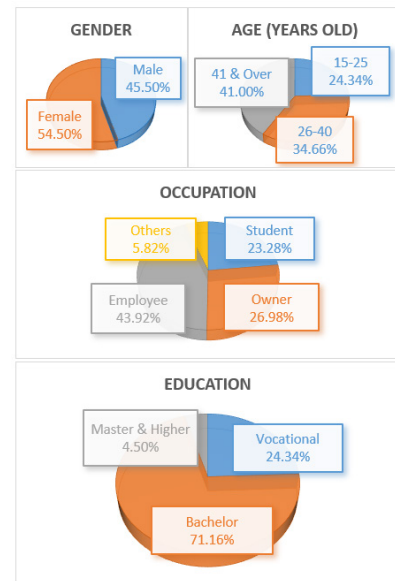


Figure 2: Information of Samples.

comments from IOC and the pre-test of these variables with a try out group shows passing criteria values.

3.2 Collecting quantitative data via marketing surveys

Sample characteristics are presented in Figure 2. The respondents are female (54.50%) and male (45.50%). Most of them are employee (43.92%), owner (26.98%), and student (23.28%). They graduate bachelor degree (71.16%) and vocational (24.34%). They are in middle age, 41 years old and over (41.00%), 26–40 years old (34.66%), and 15–25 years old (24.34%) respectively.

In order to measure internal consistency reliability and validity of construct and the reflective measurement model for the instrument, Cronbach's alpha, construct's composite reliabilities (CR), and an average variance extracted (AVE) were applied. The Cronbach's alpha is a measure of internal consistency to measure how well each individual item related to the set of test items with the threshold value of 0.70 [20]. The CR is also a measure of internal consistency in scaling items with the minimum threshold value of 0.70 [20]. Meanwhile, the AVE is an average amount of variance in indicator variables to measure the convergent validity [20]. The Cronbach's alpha, CR, and AVE coefficients aggregate to be good indicators of internal consistency.

In Table 1, the result shows the highest coefficient is consumer behavior (CB, 0.95). Marketing mix (MM) and consumer characteristic (CC) are 0.94. AVE coefficients are ranging from 0.72 to 0.77. The highest AVE coefficient is CB (0.77). CC and MM are 0.75 and 0.72, respectively. All CR coefficients are ranging from 0.75 to 0.79. The highest CR coefficients are CB (0.79) and MM (0.79). The lowest CR coefficient is CC (0.75). The correlation among variables ranges from 0.60 to 0.80. In summary, these data are found as consistent, valid, and reliable due to Cronbach's alpha coefficient while AVE and CR have passed their acceptable standards.

Table 1: Means, SD, Cronbach's alpha, AVE, CR, and Correlation

Var.	\bar{x}	S.D.	AVE	CR	CB	CC	MM
CB	3.83	0.62	0.77	0.79	(.95)		
CC	3.79	0.67	0.75	0.75	.08	(.94)	
MM	3.84	0.58	0.72	0.79	.87**	.95**	(.94)

Cronbach's alpha is presented in parenthesis.

**Correlation is significant at the .01 level (2-tailed)

CC = consumer characteristic, MM = marketing mix,

CB = consumer behavior

3.3 Data analysis by structural equation modeling

In this research, there are three hypotheses to verify, which are H1, H2, and H3. H1 is consumer characteristic has a positive effect on marketing mix, H2 is consumer characteristic has a positive effect on consumer behavior, and H3 is marketing mix has a positive effect on consumer behavior.

In order to examine the three hypotheses, the SEM model is applied. The overall model fit needs to be examined which diagnostic indices are relative chi-square ($\chi^2/\text{degree of freedom}$), comparative fit index (CFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), root mean squared residuals (RMR) and root mean square error (RMSEA) [20].

A model is considered a good fit when the construct validity congruence with empirical data. There are two sides; the goodness of fit and incremental fit index which are closer to 1 and the badness of fit is closer to 0. The criteria indices and results of model fit as shown in Table 2.

Table 2: Statistics criterion for model fit [32]

Statistics	Criterion	Results
Relative Chi-Square (χ^2/df)	< 2.00	1.018
Comparative Fit Index (CFI)	> 0.90	1.000
Goodness of Fit Index (GFI)	> 0.90	0.987
Adjusted Goodness of Fit Index (AGFI)	> 0.90	0.968
Root Mean Square Residual (RMR)	< 0.05	0.006
Root Mean Square Error of Approximation (RMSEA)	< 0.05	0.007

The chi-square indicates the difference between observed and expected covariance matrices of which the values are closer to 0 implies a better fit. The CFI examines the discrepancy between the data and the hypothesized model of which the values are closer to 1 implied a better fit. The GFI measures a fit between the hypothesized model and the observed covariance matrix and the AGFI corrected the GFI affects by the number of indicators of each latent variable of which the values are closer to 1 implied acceptable model fit [31].

The badness of fit are RMR and RMSEA. The RMR is the square root of the discrepancy between the sample covariance matrix and the model covariance matrix. In addition, the RMSEA shows avoiding issues of sample size by analyzing the discrepancy between the hypothesized model, with optimally chosen parameter estimates, and the population covariance matrix [31]. The smaller values of them imply the model fit.

Figure 3 expresses the SEM fit model for CB referring to functional beverage. The model is composed of CC and MM. CC has an indirect effect to CB through MM with a highly strong relationship at a significant level of .05. MM has a direct effect to CB with a highly strong relationship at the level of .05 as well.

The statistical analysis concludes that H1 and H3 are accepted at a significant level of .05 but H2 is rejected. Explanation is given in the following paragraphs in a detailed.

In H1, CC has a positive effect on MM in which the result shows its significance with a high coefficient (0.95). Thus, H1 is accepted. This implies that CC has a strong positive relationship with MM. Motivation, reference group, and knowledge are influential factors for a manufacturer to realize CC. Kotler and Armstrong [10] explains that a consumer has many needs at any given time, becoming motives when aroused to a

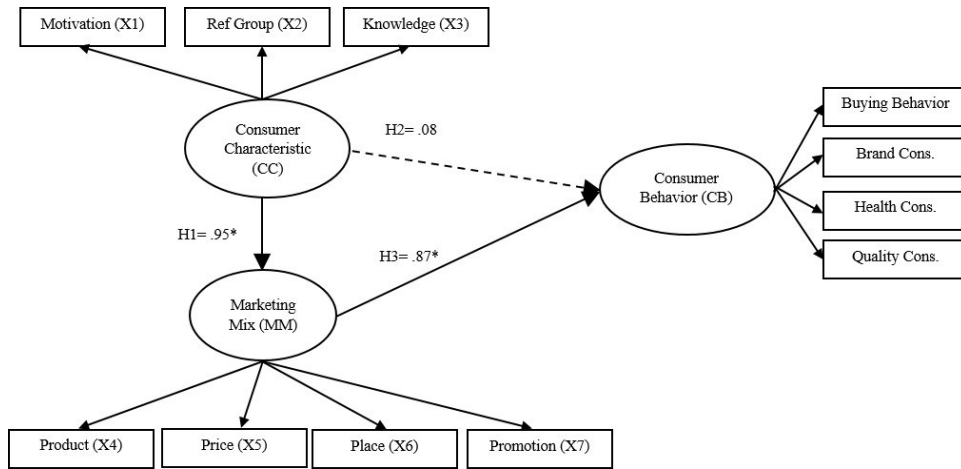


Figure 3: The SEM fit model.

sufficient level of intensity. Accordingly, the reference group has an influence on personal behavior serving as direct or indirect points of comparison by forming an individual attitude or behavior [22]. Knowledge is absorbed to a consumer through perception and learning.

In H2, CC has a positive effect on CB normally but this research result has rejected that hypothesis. The CC and CB have a slight relationship with no significance. This SEM expresses that CC has no direct effect on CB and implies that CC acts as an indirect influence through MM.

In H3, MM has a positive effect on CB, the research result shows its significance at a high coefficient level (0.872). Therefore, H3 is accepted. This implies that MM has a strong positive relationship with CB. The product, price, place, and promotion are influential factors for a manufacturer to realize when marketing programs are conducted to launch a new functional beverage. [22] explained that MM is one of several key factors in DSS of consumer behavior. A consumer can easily make a decision when purchasing a functional beverage with a reasonable price after they compare price to quality, product benefit, easily access to purchase and a promotion program. Generally, a consumer decides to purchase functional beverages based on brand reliability, quality, and health benefit.

3.4 Creating a decision support system

A DSS model of consumer behavior referring to functional beverages was developed into a computer

program. The program is separated into 3 parts: Input, Output, and Description.

The DSS model is composed of blocks for a username and a user number which must be filled in. In step 1, a user selects the number of their opinion for each independent variable. The numbers are explained as shown in Table 3. For example: Thanyathip P selects 3 for motivation, 4 for reference group, 4 for knowledge, 4 for product, 5 for price, 3 for place, and 4 for promotion. Then, the save button is clicked, afterwards, output and description of the data appears.

Table 3: Interpretation of number

No.	Definition
1	The least influence on consumer behavior
2	Less influence on consumer behavior
3	An average influence on consumer behavior
4	More influence on consumer behavior
5	The most influence on consumer behavior

In step 2, output shows the statistical values of independent variables and dependent variables such as motivation to buying behavior, brand consciousness, health consciousness, and quality consciousness which beta is 0.209, 0.161, 0.029, and 0.154, respectively; and t-value is 4.469, 3.603, 0.557, and 3.325, respectively; and significant value is 0.000, 0.000, 0.578, and 0.001, respectively.

In step 3, the description appears to explain an effect of independent variable on dependent variable. According to the above sample, motivation is the most

influential on buying behavior of which the coefficient is 0.209. In contrast, it has the least influence to health consciousness. Its coefficient is 0.029.

3.5 Verifying the model by testing with sensitivity analysis

Sensitivity analysis is a method to study how the uncertainty in the output of a model can be apportioned to different data sets of uncertainty in its inputs [32]. Therefore, sensitivity analysis predicts the effects of outputs or focuses on the outcome. When comparing the outcome, a robust model is the focus. If the outcome has no significant change, it is robust. On the other hand, if the outcome has a significant change, this means the model is not robust.

This research tests the sensitivity model by estimating new data sets of observed variables 20% increased and conversely 20% decreased from a mean value. Then, the new data sets are tested in the SEM and considered the robustness of variables.

There were seven independent variables tested in the sensitivity analysis. New data sets were prepared, not only a 20% increased section but also a 20% decreased section. The result showed motivation (X1+20%, X1-20%), reference group (X2+20%, X2-20%), knowledge (X3+20%), product (X4+20%, X4-20%), price (X5+20%, X5-20%), and promotion (X7+20%, X7-20%) are robust. Knowledge (X3-20%) and place (X6+20%, X6-20%) do not fit the model and are non-robust. The conclusion of the results is shown in Table 4.

Table 4: The result of sensitivity analysis

Variables	Robust		Non Robust	
	+20%	-20%	+20%	-20%
Motivation (X1)	√	√		
Ref. Group (X2)	√	√		
Knowledge (X3)	√			√
Product (X4)	√	√		
Price (X5)	√	√		
Place (X6)			√	√
Promotion (X7)	√	√		

The result of the sensitivity analysis expresses the research complication that knowledge (X3-20%) and place (X6+20%, X6-20%) are not robust because they changed when the mean values adjusted for both plus

20% and minus 20%. This means that CB is changed when knowledge of products decreased. Similarly, location changed for both increased and decreased. A consumer who intends to purchase a functional beverage can benefit his/her health and meets his/her desire. Therefore, a manufacturer needs to distribute knowledge to the public and raise consumer perception and learning such as advantages of beverages, benefits of ingredients, kinds of beverages, etc. Knowledge is of key importance to CB outcome. In some of the studies [11], [15] it was indicated that psychological fields have an influence on consumer decision making. Moreover, a manufacturer also has to conduct MM, remarkably for location, when presenting the beverage. Increasing or decreasing location affects CB. If distribution channels are decreased, a consumer may change his/her behavior such as canceling a purchase, changing brand. If distribution channels are increased, consumers will realize that it is easy to access, the consumer may also decide to buy more variety of the functional beverage.

Therefore, the most sensitive variable in the model is knowledge (X3) and place (X6). Knowledge has a few influences on CB. For example, health is the first point that a consumer considers when taking any beverage. Decreasing knowledge of functional beverage: benefits, ingredients or food standards may lead to a consumer having a lack of confidence in that beverage and can change his/her decision. Accordingly, place has a major influence on CB as an easily accessible distribution channel is vital. A full load of products and an attractive display on the shelf also impresses consumers as well, these all encourage a consumer to easily decide when purchasing.

3.6 The COVID-19 and functional beverage market

Cause of the COVID-19 pandemic, the global market of functional beverage is expectedly increased from \$121.18 billion in 2020 to \$130.51 billion in 2021 and is forecasted to grow up to \$173.23 billion in 2025 attributed to improving the operation process to the new normal [33]. The COVID-19 crisis has emerged health and quality consciousness of the consumers with a change in buying behavior. In the past, consumers mostly focused on the beverages that can enhance specific health benefit such as dietary and energy needs. But after the pandemic, consumer demand is

changed to the beverage that supports the immune system and enhances wellness. For example, younger age groups are worried about body-mind wellness and their mental health. Consequently, this is a good opportunity to create a product to respond to the consumer's concern. The entrepreneur has to develop the beverage to deliver benefits such as immunity, digestive health, mental health, and cognitive health [34]. However, identifying consumer satisfaction is difficult. Then, the DSS can beneficially be a tool to help the entrepreneur to make accurate decision making.

Due to the vaccination of COVID-19 to construct herd immunity, several countries such as New Zealand, Australia, Israel, and China can recover their socioeconomic and business. The functional beverage market can be grown rapidly up to supply healthy beverages. In accordance with Thailand's sandbox project, it aimed to stimulate the economic cycle of the whole tourism supply chain.

4 Conclusions

The rapid recession of the world economy since 2020 has been precipitated by the outbreak of the COVID-19 pandemic. The hospitality segment is one of the main industries tremendously affected and unavoidably has to downsize, reorganize, re-engineer, and seek certain procedures to conduct its business in the new normal era, particularly for food and beverage and tourism businesses. The SMEs still lack knowledge and effective tools to conduct research and development of products to serve customer needs.

The objectives of this research are 1) to investigate the influential factors of consumer behavior (CB) in purchasing functional beverage (FB), and 2) to construct a Decision Support System (DSS) of consumer behavior in purchasing functional beverage. The contribution is an applicable DSS of CB for Chinese tourists, which enables to realize influential factors of CB in purchasing FB when manufacturers launch a new product.

Research result expressed that consumer characteristics: motivation, reference group, and knowledge, have a direct effect on marketing mix and an indirect effect on consumer behavior through marketing mix. Moreover, marketing mix has a direct effect on consumer behavior. The marketing mix is composed of product, price, place, and promotion

while consumer behavior is composed of buying behavior, brand consciousness, health consciousness, and quality consciousness. This model is appropriate at a significant level of .05. When sensitivity analysis is applied, the result proves that the majority of the model is robust. An increasing or decreasing place and decreasing knowledge of FB can influence consumer behavior, which means changing quantity and location of stores, and lack of product information potentially alter consumer decision making.

The DSS can be an important tool to help meet Chinese tourists' satisfaction, which means that manufacturers can increase sales volume and expand product lines based on their target customers' favorite tastes and needs. Sensitivity analysis shows that store location is also a major factor for Chinese tourists in making their buying decisions. When launching a new store, manufacturers have to ensure it is strategically situated in a close proximity of tourist destinations or tourist shopping centers. Furthermore, manufacturers have to indicate the benefits of their products together with a list of ingredients and necessary information to promote and encourage buying decisions by using both English and Chinese languages, which can make an impact and increase the sales volume.

In the highly competitive market of functional beverages, the DSS program of functional beverage for Chinese tourists is very useful for functional beverage entrepreneurs due to its easy accessibility, user-friendliness, and applicability. Hence, the SMEs who have small budgets or investments can overcome this limitation to develop their businesses with an application that helps them conveniently make decisions.

The limitation of this research comes from the small sampling size of functional beverages as the research focused on only functional beverages manufactured by community enterprises.

Further study should be conducted on other target groups such as teenagers, older adults, or health enthusiasts. Moreover, this DSS can also be used in other industries to study influential factors, those of which include the food industry, beauty drinks, etc.

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