Segmenting Chinese Millennial restaurant customers: a lifestyle and health and environmental consciousness approach

Abstract

This paper provides insights into the attitudes and behaviors of Chinese Millennials towards dining out, based on a sample of 468 respondents in Hong Kong, China. Millennials are the generation that is most conscious of sustainability and personal health issues and they are contributing to the growing demand for wellness related products and services. The Chinese are the largest emerging group within this cohort for global spending and wealth creation and their consumption behaviors are increasingly influential in a resource scarce world. Prior studies have adopted various approaches to segment restaurant customers. However, none have formed segments using consumer health and environmental related attitudes and behaviors. Furthermore, there have been relatively few studies on the menu information which customers value most. Respondents in the current study were segmented on the basis of their lifestyles and health and environmental consciousness. The researchers identified six customer segments and compared their attitudes to two types of information on restaurant menus - nutrition and sustainability.

Keywords Chinese millennials, consumer segments, restaurant menus, health, environment, sustainability

Introduction

Millennials or Generation Ys, often defined as those born between the early 1980s and late 1990s, have emerged as a significant and influential consumer cohort. They have come of age through technological change, globalization and economic disruption. Such formative experiences have yielded a distinct set of behaviors. Millennials prioritize social responsibility, environmental factors, and equality in their decision-making (Shui-Jezierski, 2017). They are less brand loyal and more willing to experiment than older consumers (Anderson & Sharp 2010). Millennials are the first generation to "influence up" on the purchase behaviors of Gen Xs and the Baby Boomers (Harilela, 2017; Smiley, 2016). Millennials are the most conscious generation about sustainability and personal health and they are contributing to the growing demand for wellness related products and services

(Harilela, 2017). They are progressively becoming the largest source for global income spending and wealth creation (Scopelliti, 2016). In the Asia Pacific region half of the population will fall into this age bracket by 2020 and will be participating in the global economy (Shui-Jezierski, 2017), with China alone accounting for around 400 million Millennials. This group has a unique and distinct identity from their western counterparts. It will be advisable for forward looking companies to understand what shapes the decision making of this market (Harini, 2018).

Hong Kong, a special administrative region (SAR) of China, is one of the world's most densely populated cities. Of the population of 7.3 million, 92% are ethnic Chinese. The emerging economic and social context of Hong Kong is important for this study.It sits within the Greater Bay Area (GBA), which consists of the SARs of Hong Kong and Macau, plus nine cities of the Pearl River Delta region (Guangzhou, Shenzhen, Zhuhai, Foshan, Jiangmen, Dongguan, Zhongshan, Huizhou and Zhaoqing). As was highlighted in China's 13th Five-Year Plan (FYP), it is an important national economic development strategy. With a total population of 67.65 million residing across a total area of 56,500 sq km, this region is one of China's most developed and vibrant (Tung, 2018). The Hong Kong – Zhuhai – Macau Bridge (HZMB) opened in October 2018 and connects three cities. Meanwhile the economic growth of the GBA is expected to surpass that of the rest of China over the next three years, according to Hong Kong, Macau, and mainland Chinese company executives (Liu, 2018). In combination with the newly opened High Speed Rail Hong Kong section connecting Hong Kong with the rest of China the bridge facilitates the movement of residents across the major cities in China. With more Hong Kong residents traveling within the region, tourism products and service providers need to understand their tastes and preferences in terms of food, which is an essential component of the travel experience and a medium for cultural expression (Chang, Kivela, & Mak, 2010).

Hong Kong residents are spoilt by the variety, quality, and quantity of restaurants across the city. Within the hospitality domain, Hong Kong styles itself as Asia's "culinary capital" with over 14,000 restaurants offering diverse cuisines. Restaurant receipts amounted to 119.5 billion Hong Kong dollars in 2018 (approximately 15.1 billion USD) (Census and Statistics Department, 2019). Hong Kong consumers eat out frequently with over one quarter (26%) eating out at least daily. This is the world's highest frequency and

is also 2.6 times higher than average in Asia (Nielsen, 2016). The dining expenditures of Hong Kong residents ranked first amongst different types of retail spending (Tang, 2016; Visa, 2016). As the spending power of Hong Kong consumers has remained strong, their dining preferences have moved towards fast casual dining and home delivery or takeaway (Euromonitor International, 2017), with online food delivery growing in popularity. Including restaurant-to-consumer delivery and platform-to-consumer delivery, the sector generated US$415 million of revenue in 2017. A majority (59.2%) of the users of online food delivery services are aged 18-34 (Statista, 2018). As restaurants are reaching out to Millennials, they will need to make their products available through online platforms.

Restaurant operators commonly seek to appeal to diverse customer groups. However, limited resources prevent them from pursuing each potential customer independently. Segmentation is an important marketing principle and the first step in the sales and marketing process, which also includes, targeting, and positioning (Kotler, Bowen, Makens, & Baloglu, 2017). It is particularly valuable as a tool for marketing strategy development (Andereck & Caldwell, 1994; Kotler et al. 2017). Segmentation provides hospitality managers with insights into customer characteristics and behaviors and guides the provision of the right products and services (Lynn, 2011). It makes business sense for restaurant operators to understand the needs and preferences of the target segments when designing appealing products, services, and marketing strategies (Tan & Lo, 2008). Researchers have adopted various bases to segment restaurant customers, including demographics, consumer lifestyles, consumption motivations (Kim & Jang, 2014), and food-related lifestyle (Jang, Kim, & Boon, 2011). However, none have undertaken segmentations based on consumer health and environment related attitudes and behaviors.

More and more stakeholders within the food supply chain and consumers are recognizing the benefits of embracing sustainable food consumption, defined as the access to and use of the necessary food for an active, healthy life, through means that are economically, socially, and environmentally sustainable by all present and future generations (United Nations [UN], 2018). It is becoming more commonplace for consumers to integrate health and environmental considerations when making food choices. According to the British Nutrition Foundation's (2016) Eatwell Guide, healthy diets

contain a variety of different foods providing a wide range of the nutrients that are needed by the human body. As defined by the United Nations Food and Agriculture Organization (FAO), sustainable diets are those with "low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations" (FAO, 2010).

Triggered by the unprecedented consumer demand for such products, more restaurants are offering healthy and sustainable food and beverage options (Friel et al., 2013). Restaurant menus play an important role in the communication of such offerings to customers. Menu descriptions provide information about the food and beverages that are served in restaurants. They may be regarded as marketing claims about the products that are being sold. The most commonplace information on restaurant menus includes descriptions of the menu items, ingredients used, preparation and cooking methods, origin and nature of the ingredients, nutritional level, and caloric content. In recent years, natural and organic claims have become increasingly prevalent. Frequently used menu descriptions of animal products include claims to be "clean" such as sustainably caught, no steroids, humanely raised, GMO free and cage free (Freier & Harvey, 2018). However, the information may be obscure and potentially confusing. Furthermore, not all of the information is important for consumers. For example, a global study on consumer attitudes towards nutrition labeling found that more than 60% of Asia Pacific consumers have only a partial understanding of nutrition labels (Nielsen, 2012). Although the term "sustainability" is used in some menu descriptions, the term can appear abstract because consumers have no clear understanding of how the term relates to them personally or to the food they are eating. Most Americans associate sustainability with environmental protection, rather than with personally relevant attributes such as food quality and health (The Hartman Group, 2015). This indicates that customers do not understand the meanings of information, even when it is provided, and do not find it useful. Consumers are becoming increasingly demanding about the need for transparent menu development and sourcing (Cobe, 2018). In this context, and given the absence of studies on the restaurant menu information that customers value most, it is timely to provide clear and informative labeling that can further assist wiser and healthier decisions when procuring menu items.

Noting the increased economic power of Chinese Millennials and their consciousness of environmental and human sustainability and the limited profiling of Chinese millennial restaurant customers based on attitudes to restaurant menu information, this study has the following aims:

1) To investigate Chinese Millennial dining out behaviors.
2) To segment Chinese Millennial restaurant customers based on their health and environment consciousness and lifestyles.
3) To investigate the attitudes of Chinese Millennials towards sustainability information on restaurant menus.

Literature review

Market segmentation

Companies are increasingly recognizing the heterogeneity of customers. However, it may not be feasible for companies to offer individually customized products and services; they have proceeded to identify broad classes of customers with different preferences and responses. First introduced and defined by Smith (1956), market segmentation divides the market into distinct groups who respond to different marketing mixes (Kotler et al., 2017). Each market segment may possess distinct characteristics and needs that influence their preferences and purchasing (McDonald, Dunbar, & Marshall, 1995; Mok & Iverson, 2000).

The practice of market segmentation groups customers into homogeneous sub-groups. Wedel and Kamakura (2000) suggested three alternative approaches: a priori, post-hoc, and hybrid. The priori approach requires the advanced specification of the type and number of segments. In the post-hoc approach, the number and characteristics of the segments are determined based on the results of data analysis. The hybrid approach involves two steps including the a-priori segmentation based on one or more generic variables in the first stage followed by a second phase where the a-priori segments are further clustered based on other variables (Kazbar, van Trijp, & Eskildsen, 2010). The most popularly used segmentation bases include: descriptive (geographic, demographic and psychographic) and behavioral (benefits-sought, occasion-based and involvement) (Kotler et al., 2017). According to Chen (2003), segmentation procedures comprise two analytical stages: (1) segmentation revelation and (2) segment diagnoses. The study

samples are partitioned into different groups by using a method and according to bases in the first stage of analysis, and then descriptive and inferential statistics are utilized to profile the distinct characteristics of the derived segments in the second stage (Chen, 2003).

Most previous restaurant-related studies have adopted the a priori method. Such preexisting criteria have included dining occasion (Auty, 1992); meal purpose (Koo, Tao, & Yeung, 1999); and other socio-demographic characteristics which include gender, education, income, age, and ethnicity (Barber & Scarcelli, 2010; Honkanen, 2010; Roseman, 2006); frequency of patronage (Grazin & Olsen, 1997; Oyewole, 1999); and geographic location (Bojanic & Shea, 1997). Some studies have adopted post-hoc segmentation approaches. These include benefits sought and expectations (Oh & Jeong, 1996; Tan & Lo, 2008; Yuksel & Yuksel, 2002); complaining response styles (Gursoy, McCleary, & Lepsito, 2003); customer participation (Chen et al., 2017); reasons for preferring certain food (John & Horsefall, 2012); interest in nutrition (Olsen & Granzin, 1987); motivations for dining out (Kruger & Saayman, 2016); emotions associated with mealtimes (den Uiji, et al., 2014); values, personality traits, and familiarity (Bruwer & Li, 2007; Choe & Cho, 2011; Jang et al., 2011; Wycherleya, McCarthy, & Cowan, 2008); and food-related lifestyle (Grunert et al., 2011; Huang, Grunet, Lu, & Zhou, 2015) are commonly used post-hoc segmentation bases. Based on the consumers' food-related lifestyle, Grunert et al. (2011) identified three food consumption patterns in Asian customer segments, concerned, uninvolved and traditional. The largest segment of "concerned" consumers pursued food quality and conveyed strong concerns about environmental and food sustainability.

Health and environment related segmentation

Consumer knowledge, attitudes, and behaviors have been used frequently to segment consumer markets, notably by considering the effectiveness of increasing consumer knowledge, changing attitudes and lifestyles towards their own health, as well as environmental conditions. The present study has considered such important trends, including health consciousness, health-related lifestyles, environmental consciousness, and environmentally-friendly lifestyles, and has proceeded to use them as a base to segment consumers.

Health consciousness

The World Health Organization (WHO) has defined health as a state of "complete physical, mental and social well-being and not merely the absence of disease of infirmity" (WHO, 2017). Naylor, Droms, and Haws (2009, p. 223) defined health consciousness as the degree to which a person "plays an active role in maintaining his or her health." It reflects health concerns and an individual's readiness to take action about his or her own health (Lee, Conklin, Cranage, & Lee et al., 2014; Schifferstein & Oude Ophuis, 1998). Health conscious individuals are characterized as being sensitive to health hazards, responsible, concerned about their physical fitness, and able to manage stress and nutrition (Kraft & Goodell, 1993). They are aware of how health is influenced by lifestyles (Wardle & Steptoe, 2003). Health consciousness relates closely to and responds to health information and attitudes towards specific choices, such as organic foods. Highly health conscious people are likely to be more knowledgeable and aware of health and nutrition, though levels vary amongst individuals (Ellison, Lusk, & Davis, 2013; Namkung & Jang, 2013). A motivational component encourages consumers to enhance or sustain their state of physical well-being by engaging in preventive behaviors and health care (Michaelidou & Hassan, 2008).

Interest in health and well-being motivates health conscious consumers to make conscious choices about their food consumption (Roininen et al., 2001). The concept of health consciousness has been studied in predicting consumer food choices, purchase intentions, and healthy eating behaviors (e.g., Furnham & Forey, 1994; Gould, 1998; Hearty, McCarthy, Kearney, & Gibney, 2007; Michaelidou & Hassan 2008; Tarkiainen & Sundqvist 2009). Healthiness or health consciousness has become an important consideration when purchasing organic food (Chen, 2009; Magnusson, Arvola, Koivisto Hursti, Aberg, & Sjoden, 2001, 2003). To conclude, health consciousness has been investigated extensively as a major determinant of healthy behaviors.

Healthy lifestyles

Lifestyle may be defined as the manner in which people conduct their lives in areas that include activities, interests and opinions (Wells & Tigert, 1971). Individual lifestyles

change systematically and not randomly over time. They are influenced by values and beliefs and by the environment and are frequently used by marketers to segment and predict consumer behaviors (Chen, 2009). To improve health and well-being, it has been suggested that a narrower and operationalized definition of healthy lifestyle can focus on physical health-related behaviors. Gil et al. (2000) have suggested that healthy lifestyles involve the physical activities that are undertaken by an individual. These include consumption of natural foods, health care, and life equilibrium. In their review of health coaching studies, Olsen and Nesbitt (2010) revealed that healthy lifestyle behaviors include adopting nutritious diets, having adequate physical activity, weight management, medication adherence, tobacco cessation, avoidance of excess alcohol consumption, and preventive healthcare practices.

Environmental consciousness

Environmental consciousness is an aggregated concept that incorporates environmental knowledge, values, and attitudes, combined with emotional involvement and concern for the environment (Kollmuss & Agyeman, 2002). It refers to individual perceptions of the impacts of human behaviors on the environment and involves the propensity to engage in pro-environmental behaviors (Zelezny & Schultz, 2000). In Dunlap and Jones's (2002, p.485) study, it was defined as the degree to which "people are aware of problems regarding the environment and support efforts to solve them and/or indicate the willingness to contribute personally to their solution". Alwitt and Pitts (1996) defined general environmental consciousness as not only a measure of the importance of the environment, but as a reflection of green consumption. Schlegelmilch, Bohlen, and Diamontopolous (1996) suggested that environmental consciousness comprises of cognitive and affective components. It includes an individual's knowledge, attitudes, level of concerns, and interest about specific or general aspects of the environment. In their study of the relationship between the green practices, green image, environmental consciousness and behavioral intentions of hotel guests, De Leaniz, Crespo, and Lopez (2017) defined environmental consciousness as the degree to which individuals are concerned about environmental problems and are willing to make an effort to address them. Environmentally conscious consumers are aware of the impacts associated with their

purchases and will try to reduce the negative effects through their decisions (Schwepker & Cornwell, 1991). In a recent study of festival visitors, environmental friendly attitudes (cognitive, affective, and conative) have a positive effect on environmentally friendly behavioral intentions (Lee, Song, Lee, & Reisinger, 2017).

Environmentally friendly lifestyles

Environmentally friendly behaviors or lifestyles have been used to refer to the actions of people who contribute to the sustainable use of natural resources (Halpenny, 2006). Green purchasing behaviors demonstrate individual connection with the environment, which reference to the purchasing and consumption of products that have minimal influence on the environment (Mainieri, Barnett, Valdero, Unipan & Oskamp, 1997; Tilikidou, 2007). Many studies have found that more consumers prefer environmentally friendly enterprises (Kelly, Haider, Williams & Englund, 2007; Marin & Jafari, 2002), and are willing to pay more for environmentally friendly products (Laroche, Bergeron & Barbaro- Forleo, 2001; Manget, Roche & Munnich, 2008; Mohr & Webb, 2005; Tilikidou, 2007). Consumers are also adopting other forms of environmentally friendly activities such as to reduce, reuse, and recycle resources in their everyday lives; sacrificing convenience, accepting lower levels of performance in ecofriendly or organic products, or even paying more for these products (Han et al., 2010; Laroche et al, 2001; Manaktola & Jauhari, 2007).

A number of studies have suggested that consumer commitments to purchasing green products or intentions to pay higher prices are often based on environmental attitudes (Chan, 1996; Chan, 1999; Fraj-Andres & Martinez-Salinas, 2007; Grunert & Juhl, 1995; Kim & Choi, 2005; Kim & Han, 2010; Martin & Simintiras, 1995; Schlegelmich et al., 1996; Tanner & Kast, 2003; Tilikidou; 2007). Based on evidence from the environmental literature, Tan and Yeap (2012) concluded that studies have produced inconclusive results to support the relationship between environmental friendly attitudes and environmentally friendly behaviors.

Attitudes towards menu information

Restaurant menu information signals the "marketing claims" of the products being sold and can affect customer purchasing behaviors, and their perceptions of the quality and

value of restaurant experiences (Wansink, Painter, & van Ittersum, 2001). Mills and Thomas (2008) identified three types of menu information that is sought by consumers: nutritional information, product information, and food preparation. Fakih et al. (2016) assessed the importance of these three dimensions in determining customer attitudes and intentions to visit a restaurant. With increasing health and environmental concerns and the adoption of health conscious and environmental friendly lifestyles, it is evident that such menu information can help customers understand what they are consuming and can inform their dining decisions. A study conducted in the United States concluded that growing numbers of restaurant diners are interested in sustainable menu options, healthy eating choices, and higher food quality. Many diners are looking for transparency in the menu when dining out and prefer healthier, higher-quality food (The Hartman Group, 2015).

Nutritional information

Consumers are increasingly conscious about their well-being, about what they are eating and how diet affects their health. Dining out involves considering what they are ordering and eating. Therefore, nutritional information on the menu can help restaurant diners understand what they are consuming and make informed choices (Hwang & Lorenzen, 2008). Some countries such as the U.S.A. now require restaurant menus to present nutritional information (such as total calories, fat, saturated fat, cholesterol, sodium, total carbohydrates, sugars, fiber, and protein), whereas others have adopted voluntary approaches (Kim, E. et al., 2013). In 2014, the new food labelling in the European Union forced all restaurants to list the 14 different allergens in restaurant menus, including nuts, gluten, lactose, soy or milk. This legislation helps consumers to make informed decisions about the food that they are buying, thereby contributing ultimately to healthier lifestyles (Jacobsen, 2014). The nutritional information provides consumers with more flexibility to select healthy food items which share their attitudes and purchase intentions (Kang et al., 2015). Researchers have proposed that restaurants claiming to adopt adhere to responsible business practices, should inform their customer about the nutritional value and content of the food items that may be detrimental to their health or contrary to their beliefs (Granzin & Bahn, 1988; Mills & Thomas, 2008).

The nutritional information that is presented on restaurant menus varies across different countries and outlets. Mills and Clay (2006) have suggested that menu information, such as: means of preservation, quality of food, information on harmful foods, cooking methods and ingredients present in the menu items - are important factors for restaurant menu selections. Mills and Thomas (2008), found that customers expect restaurant menus to provide nutritional information, product information, and food preparation information based on the Truth-in-Menu Law. Nutritionix, a website which provides nutritional information about grocery foods, restaurant menu items, and common foods, has include information such as calories, fat content, cholesterol, sodium, carbohydrates, dietary fiber, sugars, protein in the nutritional label for the restaurant menu items from different restaurants (Nutritionix, 2017). Jang et al.'s (2011), study included nutritional information, low-fat, and vegetarian choices as important selection attributes for customers to dine in a green restaurant.

Sustainability information

Customers are not only concerned about their personal health, but also about the health of the planet and about human impacts. More and more consumers are conscious of the environmental effect of agriculture, food processing, transportation, and preparation of meals, and human food consumption (Gossling, Garrod, All, Hille, & Peeters, 2011). As a result, consumer interest has increased in eco-friendly products and product-related information (Jang et al., 2011). Consumers are also adopting more sustainable diets and making more informed choices about what they consume. Thanks to the efforts of different environmental groups such as the World Wildlife Fund that educate consumers about the environmental impacts of human consumption and provide suggestions about sustainable diets such as consuming less processed food, reducing food waste, eating more plants and less meat, and buying food that meets a credible certified standard (WWF, 2011). In response to pressure from government legal requirements, from environmental groups, and as a result of consumer interest, restaurant operations are adopting more green and sustainable measures. Currently, going green in restaurants is not only implemented by reducing solid waste, water consumption, energy consumption and air pollution (Carbonara,

2007; Johnson, 2009), but also by offering a selection of green food menu items that use locally grown or organic certified food (Jang et al., 2011).

During the period since 2011 there has been a 74 percent increase in the number of menu items labeled as "sustainable" across the more than 9,000 restaurants in the U.S.A. (Taylor, 2014). A 2008 National Restaurant Association survey of more than 1,600 professional chefs in the U.S.A. concluded that locally grown and organic produce will be the hottest menu trend in the near future. Organic, locally sourced, seasonal, fairly traded, and ingredients being produced or farmed according to sustainability standards are considered as "green food" in the restaurant industry (LaVecchia, 2008). Namkung and Jang (2013) found that green practices that focus on foods (i.e., healthy and fresh menu choices, locally grown, organic, and sustainably produced foods) were more effective for enhancing a green brand image and behavioral intentions than adopting an environmental focus. Jang et al. (2011) also identified that emphasizing the use of natural or organic ingredients by restaurants and the availability of nutritional and healthy menu choices are factors that affect green restaurant selections. To lower meat consumption, Ravn Heerwagen et al. (2014) propose marketing and promoting organic food as a way to entice health conscious and environmentally awareness amongst consumers. Surprisingly the selection of organic foods products for customers in Hong Kong restaurants did not seem to be a priority, as chefs feel that the cost of organic foods was not justified. Carbon emissions are another environmental impact of food production and consumption (Pratt, Mackenzie, & Lockwood, 2017). Some countries such as Sweden have imposed mandatory carbon emissions labeling for grocery items and restaurant menus. The information on carbon emissions helps consumers understand the effects of their food consumption on the environment and assists them to make informed decisions about their food and beverage choices.

Previous studies have concluded that customers who exhibit different demographic characteristics (i.e., gender and age) may have distinct dietary behaviors (e.g., Robinson and Smith, 2002; Satia et al., 2005; Trudeau, Kristal, Li, & Patterson, 1998), habits of reading nutritional labels (Satia et al., 2005), and likelihood of choosing menu items that are deemed healthier, meet nutritional guidelines, or provide calorie information (Sosa, Biediger-Friedman, & Banda, 2014). On this basis, the present study will assess whether

various segments of Chinese millennials have distinct perceptions about the importance of nutritional and sustainability information on restaurant menus.

Methodology

Research design and data collection

With the aim of segmenting the respondent population, the researchers used street-intercepts to collect cross-sectional data . The location that was selected for the conduct of the study was an outdoor plaza with a sitting area, fountain, and landscaped gardens located in a business district within Hong Kong. Office buildings and shopping centers surrounded the plaza and a large public university was located nearby. The data were collected over seven days from Monday through Sunday during three different meal periods (lunch, afternoon, and dinner). Targeted respondents were invited to participate in the study using an availability sampling approach. After they had agreed to participate, respondents were provided with a self-administration questionnaire. The first section measured the respondents' health consciousness, health-related lifestyles, environmental awareness, and environmentally-friendly lifestyles. The measurement items were adapted from previous research (Chen, 2009; Chen, 2011; Michaelidou & Hassan, 2008; Laroche, Bergeron, & Barboro-Forleo, 2001; Lee, 2010; Lee et al., 2017; Lee at al., 2014; Sparks & Guthrie, 1998). The second part included questions measuring the perceived importance of nutritional and sustainability information in restaurant menus. The measurement items were adapted from Fakih et al (2016); the Green Restaurant Association (2014), Jang et al. (2011), Scheibehenne, Meisler, & Todd. (2007), and WWF (2011). Twenty-five hospitality management academics were asked to evaluate the relevance of the measurement items using a 5-point relevant-scale ranging from 1 (not relevant at all) to 5 (extremely relevant). The questionnaire also included questions to obtain respondent information about demographic and dining behaviors. The questionnaire was designed in English and was translated into traditional Chinese. A pilot test was conducted to fine-tune the survey instrument. A convenience sample of 148 Hong Kong Millennials was invited to participate in the pilot test. Reliability tests were conducted on the statements measuring the relevant constructs. The final statements measuring the different health and environmental attitudes

and lifestyles and their perceived importance of nutritional and sustainability menu labels are shown in Table 1.

[INSERT TABLE 1 HERE]

The sample for the main study consisted of Hong Kong Chinese residents aged 18-34 (Millennials) who had patronized a restaurant within the previous six months. Information was obtained about respondent demographic characteristics, as well as their frequency of consuming meals outside the home (during the previous week), their health-related attitudes and lifestyles, environmental attitudes and lifestyles, and their perceived importance of nutritional and sustainability labels on restaurant menus. A seven-point scale was used to measure health consciousness and environmental awareness with 1 indicated "strongly disagree" to 7 indicating "strongly agree". Healthy lifestyle and environment-friendly behavior were measured with seven-point scale with 1= "never", 2= "rarely" (less than 10% of them time), 3= "occasionally" (about 30% of the time), 4= "sometimes" (about 50% of the time), 5= "frequent" (about 70% of the time), 6= "usually" (about 90% of the time), and 7= "always".

Data analysis

A total of 468 usable samples were obtained and SPSS 23.0 was used to for the data analysis. Descriptive statistics were used to analyze the demographic information and dining out behaviors. Exploratory factor analysis (EFA) with principal component extraction with varimax rotation was used to assess the unidimensionality of the constructs. As suggested by Hair et al. (2006), the sample size for EFA should be based on a ratio of 10 observations to one variable, and as there were 29 attributes to be factor analyzed, 290 observations would have been appropriate. Due to the absence of rules when conducting cluster analyses, the determination of an appropriate sample size depends on whether the dimensionality is excessive for the number of cases that is to be grouped (Dolnicar, 2002). The reliability of each dimension was tested here by assessing the Cronbach's alpha. First, the correlation matrix was inspected to ensure a sufficient number of correlations greater than 0.3 to justify the use of factor analysis. Bartlett's test of sphericity and the KMO-MSA were also used to determine whether sufficient correlations existed among the variables. Bartlett's test of sphericity should be statistically significant (sig. at 0.05), and the KMO-

MSA should have an index of between 0 and 1, with an index closer to 1 signifying that each variable is perfectly predicted without error by the other variables. Both the KMO-MSA (0.888) and Bartlett's test of sphericity (0.000) indicated that the data were appropriate for the purposes of factor analysis.

Hierarchical and K-means clustering were adopted to segment the respondents, using the variables measuring their health consciousness, health-related lifestyles, environmental awareness, and environmentally-friendly lifestyles. The number of clusters was first determined by using Hierarchical clustering with Ward's Method. Based on the "elbow's rule", the stage where the "distance coefficients" make a bigger increment was identified (462). The number of cluster was then calculated by subtracting the stage number with the highest coefficient distance by the number of samples (i.e. 468-462=6). Then, based on the number of clusters identified in the Hierarchical cluster analysis (six), K-means cluster analysis was then adopted to form the clusters. Profiling of the different clusters was also conducted to describe the characteristics of each cluster identified. Discriminant analysis was conducted to assess how well the health and environmental awareness and lifestyle factors predicted membership in each cluster. Weights of different combination of the determinant factors were used to maximize the distance between the identified clusters. Finally, One-way ANOVA was conducted to compare the perceived importance of the nutritional and sustainability menu labels when dining in restaurants for the different clusters.

Results

Demographic and behavioral characteristics

As is shown in Table 2, slightly over half of the respondents (53.6%) were female. The resulting gender distribution closely resembles the Hong Kong population that is 53.7% female (Census and Statistics Department, 2017). Almost three quarters of the respondents live in a household with 3-4 people. Table 3 shows that 4,050 main meals were consumed outside the home (including breakfasts, lunches, and dinners), accounting for 41.2% of all main meals consumed during the week. The most popular meal times were lunches during weekdays (1,987 meals) representing about 49.1 percent of the total meals consumed outside the home. Fridays and Tuesdays respectively were the most popular days for lunch

out. For dinners, Saturdays were the most popular with 217 meals (16.7% of the total number of dinners) consumed outside the home. 762 breakfasts were consumed outside the home which represented the 18.8 percent of the total meals consumed and 23.3 percent of all respondents' breakfasts consumed in the week. 127 breakfasts were consumed outside the home on Mondays which constitutes 16.6 percent of all breakfasts during the week.

[INSERT TABLES 2 & 3 HERE]

Dimensions of the segmentation criteria

Six factors were identified to segment the respondents and explained 60.35% of the total variance. "Health consciousness" and "Environmental awareness" were confirmed as two one-dimensional constructs. "Healthy lifestyles" were found to have two dimensions, namely: "Physical lifestyle" and "Psychological lifestyle". "Environmentally friendly behavior" was also found to have two dimensions which included "Personal consumptions" and "Utilities consumptions". Table 4 shows that all segmentation criteria have sufficient internal reliability with Cronbach alphas ranging from 0.75 to 0.86. Respondents were found to have a higher mean score for "Environmental awareness" (mean = 5.89) than for "Health consciousness" (mean = 5.52). The score for the conscious consumption of utilities (mean = 5.04) was higher than the comparable scores for environmentally friendly personal consumption (mean = 4.08). The respondents also reported comparatively higher mean scores for their healthy psychological lifestyles (mean = 4.85) than healthy physical lifestyles (mean = 4.56).

[INSERT TABLE 4 HERE]

Perceived importance of nutritional and sustainability menu labels

Table 5 shows that the Cronbach's alphas for the statements measuring the perceived importance of nutritional menu labels and suitability menu labels were 0.89 and 0.82 respectively, thereby demonstrating internal reliability of the measurement items. The mean score of the perceived importance of nutritional menu labels (mean = 4.79) was higher than sustainability menu labels (mean = 4.65). The results also showed that the sustainability label statement with the highest score was "Provides carbon emission/carbon

foot-print information for individual menu items" (mean = 5.13) and the one with the lowest score was "Uses organic food" (mean = 4.38). For nutritional label statements, "Offer low-salt option" had the highest mean score (mean = 5.06) whereas "Offer low-carb options" had the lowest mean score (mean = 4.49).

[INSERT TABLE 5 HERE]

Cluster and discriminant analysis

The researchers identified six clusters with sufficient size and coherence based on respondent health consciousness, healthy physical lifestyles, healthy psychological lifestyles, environmental awareness, environmentally friendly consumption, and environmentally friendly consumption of utilities. The respective sizes and scores of the segmentation variables are shown in Table 6. The discriminant analyses showed a significant Wilks's Lambda of 0.061 ($p<0.001$), indicative of an overall significant mean difference in perceived importance of the health and environmental awareness and lifestyle factors across clusters. The Box's M statistics of 183.138 ($p<0.001$) suggested that the covariance matrices were equal. The results of the discriminant analysis indicated that the six health and environmental awareness and lifestyles factors were significant predictors of cluster membership at a significance level of 0.000. The classification results showed that 95.7% of the original cases were correctly classified into the clusters.

Oneway ANOVA was then used to determine whether significant differences existed amongst the mean factor scores of each cluster. Table 6 presents the six different clusters and their respective mean factor scores based on health consciousness, healthy physical lifestyle, healthily psychological lifestyle, environmental awareness, environmentally friendly personal consumption, and environmentally friendly utility consumption. The results show that "Environmentally friendly personal consumption" has the highest difference in mean factor score across the six different clusters (F=77.904), followed by "Environmental awareness" (F=76.669), and "Healthy psychological lifestyle" (F=72.285). "Health conscious" has the least difference among the six clusters (F=7.822). Each cluster was labeled according to the characteristics of its composites.

Segment 1 “Healthy spirits” comprises of 12.8% of the sample, with almost 2/3 (66%) being female. This group has a relatively high mean factor score on health consciousness (0.385) and healthy psychological lifestyle (0.675), though is negative on healthy physical lifestyles (-1.555). The mean factor scores were low for environmental awareness (-0.009), environmentally friendly personal consumption (0.178) and conscious consumption of utilities (0.096). These findings suggest that group members have healthy psychological lifestyles and are generally health conscious. However, they have less environmentally friendly attitudes and lifestyles.

Segment 2 “Healthy environmentalists” (23.9%) make up the largest segment and 53.6% of them are female. This group is high in environmentally friendly personal consumption (0.785) and environmental awareness (0.646). Their environmentally friendly consumption of utilities (0.161) is relatively lower. Their health consciousness is negative (-0.271) but their healthy physical lifestyles (0.430) and healthy psychological lifestyles (0.359) are moderately high. Apart from being health conscious, this group adopts both healthy physical and psychological lifestyles. They exhibit environmentally friendly personal consumption practices.

Segment 3 “Environmental hypocrites” comprise 13.9% of the sample and 43.1% of these are female. They are high in environmental awareness (0.654), but exhibit negative mean factor scores for environmentally friendly personal consumption (-0.776) and environmentally friendly consumption of utilities (-1.075). Group are high in healthy physical lifestyles (0.493) and relatively lower in health consciousness (0.158) and healthy psychological lifestyles (0.076).

Segment 4 “Health conscious but not healthy” makes up 16.2% of the sample. 57.9% are female. They are relatively high in health consciousness (0.380) but reported negative in physical (-0.169) and psychological lifestyles (-1.428). Their environmental awareness is low (0.131) while their environmentally friendly personal consumption (0.240) and environmentally friendly utility consumption (0.217) are moderate.

Segment 5 “Utility savers” comprise of 16.4% of the sample and 50.6% are female. They are high in environmentally friendly utility consumption (1.059) but negative in environmentally friendly personal consumption (-1.109) and environmental awareness (-

0.317). They are very low in health consciousness (-0.237) and healthy physical lifestyle (0.096) but moderately high in healthy psychological lifestyle (0.320).

Segment 6 "Indifferent" makes up 16.7% of the sample. 51.3% are female. They have negative factor mean scores in environmental awareness (-1.282), health consciousness (-0.175), environmentally friendly utility consumptions (-0.665), and healthy psychological lifestyles (-0.023). Their healthy physical lifestyle (0.238) and environmentally friendly personal consumption is moderate (0.244). This segment is least concerned about environmental issues among all segments. They are also not quite health conscious.

[INSERT TABLE 6 HERE]

Segment comparisons

The segments did not differ in terms of gender distribution, based on the chi-square statistics, (χ^2 =0.155). Further analysis was conducted to determine whether the six segments differed in their perceived importance of nutritional and sustainability menu labels when dining out. Table 7 shows that the segments have different levels of perceived importance for nutritional and sustainability labels on restaurant menus.

The largest segment identified in this study is Segment 2 "Healthy environmentalists" segment. 23.9% of the respondents belong to this group. This group also has the highest perceived importance of both nutritional and sustainability labels, especially those related to low salt, gluten free, and healthy cooking methods. At the same time, this group has the highest importance in sustainability labels (mean = 5.11). The provision of carbon emission/footprint information is of the highest importance to this group. Restaurants targeting this segment may consider to source and incorporate sustainable ingredients, manage their preparation methods that improve the nutritional profile of their menu items, and providing carbon emission/footprint information.

Segment 4 "Health conscious but not healthy" (16.2% of the respondents), Segment 5 "The utility saver" (16.4%) and Segment 6 "The indifferent" (16.7%) are similar in size. Similar to Segment 2, Segment 4 "The health conscious but not healthy" segment also places higher perceived importance on nutritional labels. However, their perceived importance of sustainability information (mean = 4.73) is significantly lower comparing to

Segment 2. This segment places significantly high importance in carbon emission/footprint information (mean = 5.34). Therefore, to appeal to this group, focusing on nutritional information on the menu, particularly low-salt, gluten-free, and low-calorie information will be relevant as these statements have significantly higher importance scores. Sustainability information on carbon emission/footprint in particular will also be relevant for this segment.

Segment 5 "Utility savers" segment placed the lowest importance for both nutritional (mean = 4.51) and sustainability information (mean = 4.42) among all. Offering low-carb options (mean = 4.16) and the use of organic food (mean = 3.97) are the two least important nutritional and sustainable menu information.

Segment 6 "Indifferent" segment has the lowest importance in sustainability menu information (mean = 4.40). This group finds that the information about the ingredients used (mean = 4.35) is the least important nutritional information and the use of organic food (mean = 4.18) as the least important sustainability information.

Segment 3 "Environmental hypocrite" segment has comparatively lower importance in nutritional information (mean = 4.57) than Segment 2 and 4. Similar to Segment 5 and 6, this group has the lowest perceived importance in sustainability information of low-carb option (mean = 4.23) on the restaurant menu. This group has the lowest perceived importance in ingredients produced in an environmentally friendly way among all the segments (mean = 4.22).

Segment 1 "Healthy spirits" is the smallest of the six (12.8% of the respondents). Similar to Segment 3 and 6, this group attaches relatively lower importance to nutritional menu information (mean = 4.77), compared with Segments 2 and 4. However, among all the nutritional information, the importance of gluten-free information has the highest importance score (mean = 5.02). This group also demonstrates low importance in sustainability labels (mean = 4.50), in the use of organic food (mean = 4.23) and has the lowest score among all sustainability labels. Menu information on gluten-free options may draw the attention of this group because it has the highest importance score.

Segments 6, 3, and 1 attach significantly lower importance to nutritional labels than Segments 2 and 4. Of the various segments, Segment 2 has the highest perceived importance scores in sustainability labels. It is however evident that neither nutritional nor

sustainability menu information would appeal to Segments 3, 5, and 6. Marketers may need to explore other forms of menu information such as appearance, portion size and price which may be viewed as more important when dining out.

[INSERT TABLE 7 HERE]

Discussion and implications

It has been noted that respondents consume over 40% of their meals away from home. This finding supports a Nielsen report (Nielsen, 2016), Global Ingredient and Out-of-Home Dinning Trends, which indicated that nearly 48% of their global respondents eat out at least weekly. Lunch and dinner were the most commonly eaten meals away from home, while fewer respondents indicated eating out for breakfast. However, evidence points to the market trend towards breakfast outside the home. The 2016 Nielsen report also registered lunch and dinner as the meals that U.S. consumers most frequently eat away from home. The same report shows that 21% of the out of home diners in the U.S. and 18% of those in Asia are more likely to eat breakfast away from home. The Department of Health (2007) commissioned report on eating out habits of Hong Kong residents commented that 53% of their survey respondents had taken breakfast outside the home during the week.

The present study noted that millennial consumers exhibit higher environmental awareness than actual environmentally friendly lifestyles. The researchers have also confirmed Jang et al.'s (2011) finding that consumer interest in eco-friendly products and in product-related information has increased. Kollmuss and Agyeman (2002) summarized some conceptual frameworks that explain pro-environmental behaviors, namely linear models, altruism, empathy and prosocial behavior models, sociological models, economic models, and psychological models. Previous researchers have concluded that awareness leads to positive environmental attitudes and in turn to pro-environmental actions. However, the present findings suggest a degree of mismatch between high awareness or consciousness and translation into action. The present results align with those of Ortega-Egea, Garcia-de-Frutos, and Antolin-Lopez (2014) in their various studies of European consumers. They concluded that even though respondents had high awareness and environmental concerns, there was a low incidence of persistent behavioral change. Similarly, respondents have higher levels of healthy consciousness compared with their

actual healthy lifestyle behaviors. Chen (2011) showed that Taiwanese residents have higher levels of healthy lifestyles compared with health consciousness. The different findings may be because the current study has focused on Chinese Millennials, while Chen's (2011) study sampled a wider population.

The present study has investigated Chinese Millennial attitudes towards nutritional and sustainability information on restaurant menus. There were mixed responses to the perceived importance of menu labels. The results indicate that nutrition is rated as having higher importance for labeling purposes than sustainability. This suggests that respondents were more concerned about their present wellbeing than about Hong Kong's future food sustainability and security. Though consuming fresh fruit and vegetables were viewed as important for maintaining a healthy lifestyle, lesser importance was attached to consuming sustainable foods and purchasing organic food,. The "healthy-environmentalists" segment exhibited greater concern about the potential impact of Hong Kong's environmental problems on their health than about nutritional labeling and the sourcing of sustainable foods. However, in the face of increasing awareness of food provenance and sensitivities, respondents did attach more value to the importance of nutritional labels as a potential impact on their health rather than on the state of the environment. Healthy cooking, low salt and low calorie options were highly rated with gluten free options being the most highly sought after. This finding supports Kim et al.'s study (2013) on Korean restaurants where customers perceived nutritional information, fresh and natural ingredients and weight control as being valuable. This finding also supports previous research about the importance of including nutritious items on restaurant menus (Yüksel & Yüksel 2002). It suggests that Millennials in particular are attaching increased importance to the provision of nutritional information.

Market segmentation is essential for the identification of groups of restaurant customers and to develop appropriate marketing strategies (Tan & Lo, 2008). In adopting a priori and post-hoc approaches, researchers have found the latter to be particularly effective. The segmentation of restaurant customers has included reasons for food preferences (John & Horsefall, 2012), interest in nutrition (Grazin & Olsen, 1997), dining out motivations (Kruger & Saayman, 2016), and food-related lifestyles (Huang at al., 2015). The present study has used health and environment related consumer attitudes and

behaviors for segmentation purposes and has provided insights into millennial's dining preferences, noting an increase in knowledge, attitudes, and lifestyles concerning their own health as well as the state of the environment. The study adopted a post-hoc approach to segment Chinese millennial consumers based on their health consciousness, health-related lifestyles, environmental consciousness, and environmentally friendly lifestyles. Six segments were identified, namely "Healthy spirits", "Healthy environmentalists", "Environmental hypocrites", "Health conscious but not healthy", "Utility savers", and "Indifferent". The results indicate that the six segments attach differing perceived importance to nutritional and sustainability information on restaurant menus. Although various customer segments have been identified, restaurants should each on the basis of size and growth potential and match these with organizational resources and objectives to allow the selection of the most effective target markets (World Tourism Organization and European Travel Commission, 2007). Restaurant managers may customize their menu offerings and information to meet the needs of their targeted segments, based on health- and environment- related attitudes and behaviors, and perceived importance of nutritional and sustainability information on restaurant menus. Though the concept of health and sustainability has gained attention among Chinese consumers over the past decade, adopting sustainable practices at the personal level still lags the practice of their western counterparts. Restaurant operators and chefs may take the opportunity to influence the industry by making procurement decisions to support human and environmental sustainability. They are in a position to merge culinary and sustainability concepts in their restaurant menus, thereby educating consumers about the importance of consciously sourced ingredients and healthy dining options.

Conclusions and further research

This study has provided new insights about Chinese millennial customers, a group that is poised to become the largest source of spending and wealth creation globally by 2025. The findings have confirmed that Millennials merit attention from restauranteurs since they consume over 40% of their meals outside the home and are contributing to the future of food consumption in Hong Kong. The researchers have observed that lunches and dinners

constitute most of the meals consumed by Hong Kong Chinese Millennials outside the home, though breakfasting out is also commonplace.

It has been noted that most previous studies on health and environmental consciousness and lifestyle have been conducted in western countries, this investigation is one of the first to have adopted health and environmental consciousness and lifestyles for segmentation purposes in the context of Chinese millennial consumers. The perceived importance of nutritional and sustainable menu information was used to profile and compare the six segments. Consumers are demanding more transparency about what they are eating. More restaurant owners, operators, and managers can respond by providing nutritional and sustainable information of menu items, which is currently not commonplace amongst restaurants in Hong Kong and China. Such additions could potentially play an important role in helping consumers to make more informed choices about their consumption. They can also help to educate consumers through their menus, thereby influencing consumer food choices and contributing to healthy lifestyle and environmental friendly behaviors.

"Healthy environmentalists" were identified as the largest segment of Chinese millennial restaurant customers. This group attaches significantly higher importance to both nutritional and sustainability information on restaurant menus. In addressing their needs, restauranteurs may consider introducing menu items such as convenient organic, sustainable fast foods and products that highlight health benefits that meet the needs. These prospective offerings might also appeal to the "Health conscious but not healthy" Millennial segment. Though the "Indifferent" and "Utility saver" segments evidently attach the lowest importance to nutritional and sustainability information on restaurant menus, they could still benefit from exposure to menu information which might have longer run influence on their attitudes and behaviors towards health and the environment.

The substantial market for breakfasting out in Hong Kong may be propelled by consumers' lack of time to prepare their own meals and the convenience and value-for-money out-of-home breakfast options. Coffee shops and cafes are enlarging their menus to include more breakfast options, while some quick-service and franchised restaurants have introduced breakfast service or extended its availability throughout the day. Many restaurants are undoubtedly capitalizing on this expanding trend by including healthier and

sustainable menu options that appeal to time-poor Millennials and are concerned about their health. A marketing message that reflects these elements (e.g. healthy quick food items that are low in salt, carbohydrates and identified as gluten free) might help to retain existing and attract new customers.

Technological developments are providing enhanced access to health information and products that allow customers to exercise greater control over their health, environmental consciousness and lifestyles. Online food delivery is increasing in popularity amongst Hong Kong consumers. Restaurateurs that deliver through these online platforms targeting increasing millennial concerns about health and environment, can include more sustainability and nutritional information on menus. They may play an educative role about nutrition and sustainability. If online food delivery websites are able to collect information about health and environment from prospective diners, this might inform a new customer base about how health and environment related lifestyle choices can attract customers based on their menu preferences and choices.

As is commonplace in much consumer research, this study has some limitations and the results should be interpreted with caution. Data were collected in a single location over a concise time period and a non-probability sampling method was used. For this reason, the results may not be generalizable to other age groups in different regions or countries. The researchers collected data based on self-reporting surveys. In the context of sustainability behaviors and lifestyles, people may tend to provide socially acceptable answers. Furthermore, respondents may overstate their engagement in socially desirable behaviors (e.g. environmentally conscious). Environmental related studies have shown that individuals may respond to certain questions in ways that reflect social or political correctness, rather than their genuine beliefs and perceptions (Ewert & Galloway, 2009).

Future researchers might consider conducting studies in real dining settings where actual menu items being ordered can be tracked during different meal times and compared against the self-claimed importance of the menu labels. This initiative could close the research gap between perceptions, intentions, and actual behaviors. The current research can also be extended to investigate Chinese millennial customers from other parts of China and for different restaurant types such as fine dining, casual, and quick service.

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Table 1: Measurement items of health and environmental attitudes and lifestyle and importance of nutritional and sustainability menu labels

Constructs	Items	Sources
Health consciousness	My health is valuable to me. I am aware of the changes in my health. I take responsibility for the state of my health. I am health conscious. I understand healthy eating.	Chen (2009), Michaelidou & Hassan (2008)
Healthy lifestyle	I often eat fruit and vegetables. I balance my work and personal life. I can manage stress. I follow a healthy diet. I have quality sleep. Wherever possible I avoid eating processed food. I undergo regular body checks. I exercise regularly.	Chen (2009; 2011)
Environmental awareness	Hong Kong's environmental problems are affecting our health. It is urgent to tackle Hong Kong's environmental problems. Hong Kong's environmental problems are worsening. Environmental problems are affecting Hong Kong's reputation. The current development of Hong Kong is destroying the environment.	Lee (2011)
Environmentally friendly lifestyle	Switch off lights when not in use. Turn off taps while brushing teeth, soaping hands, or shaving. Pay attention to energy-efficiency labels when purchasing electronic appliances. Use durable rather than disposable tableware. Turn off electronic appliances completely (not on stand-by) when not in use. Take shorter showers. When shopping choose less packaged types of product, fewer plastic bags and paper wrappings. Use recycle bins to separate glass, aluminum, plastic, or paper waste. Donate unwanted electronic appliances, computers, toys, or clothing to charity groups. Buy organic food.	Laroche, Bergeron, & Barboro-Forleo (2001)

Constructs	Items	Sources
	Consume sustainable seafood *. (*Seafood comes from well-managed fisheries where seafood is caught or farmed in an ecologically-friendly way.)	
Nutritional menu labels	Offers low-fat options. Offers low-salt options. Offers low-calorie options. Offers menu items prepared using healthy cooking methods. Offers low-carb options. Provides nutritional information for the individual menu item. Provides information about ingredients used when preparing menu items. Offers gluten-free options.	Fakih et al., 2016, Green Restaurant Associations (2014), Jang *et al.* (2011), Scheibehenne *et al.* (2007), and WWF (2011)
Sustainability menu labels	Uses ingredients from sustainable sources. Offers vegetarian choices. Uses fairly-traded food products (e.g., coffee beans, tea, or chocolate). Uses ingredients produced in an environmentally friendly way. Uses organic food. Provides carbon emission/carbon foot-print information for individual menu items.	Green Restaurant Associations (2014), Jang *et al.* (2011), Scheibehenne *et al.* (2007), and WWF (2011)

Table 2: Respondent demographic characteristics (N=468)

Demographics	Frequency	Percent
Gender		
Male	217	46.4
Female	251	53.6
No. of people in household (including yourself)		
2	15	3.2
3	130	27.8
4	218	46.6
5 or more	105	22.4

Table 3: Meals consumed outside home (n=468)

	Breakfast	Lunch	Dinner	**Total**
Monday	127	301	172	**600**
Tuesday	115	310	188	**613**
Wednesday	110	298	188	**596**
Thursday	112	302	178	**592**
Friday	110	305	187	**602**
Saturday	92	261	217	**570**
Sunday	96	210	171	**477**
Total	**762**	**1,987**	**1,301**	**4,050**

Table 4: Health and environmental attitudes and behaviors

Description	Mean	SD	Factor loadings	Eigenvalue	Variance (%)	Cronbach's Alpha
Health Consciousness [A]	***5.52***			***3.44***	***11.87***	***0.86***
I am health conscious.	5.31	0.981	0.764			
I understand healthy eating.	5.36	0.873	0.648			
My health is valuable to me.	5.86	0.882	0.787			
I am aware of changes in my health.	5.51	0.945	0.768			
I take responsibility for the state of my health.	5.53	1.012	0.733			
Healthy Physical Lifestyle [A]	***4.56***			***2.57***	***8.856***	***0.78***
I follow a healthy diet	4.92	1.117	0.641			
I exercise regularly	4.58	1.471	0.680			
I often eat fruit and vegetables	5.18	1.219	0.533			
Wherever possible I avoid eating processed food	4.35	1.276	0.642			
I undergo regular body checks	3.77	1.420	0.534			
Healthy Psychological Lifestyle [A]	***4.85***			***2.11***	***7.29***	***0.75***
I can manage stress.	4.96	1.086	0.808			
I balance my work and personal life.	4.97	1.106	0.789			
I have quality sleep.	4.60	1.376	0.643			
Environmental Awareness [A]	***5.89***			***3.37***	***11.62***	***0.86***
Hong Kong's environmental problems are worsening.	5.88	0.811	0.769			
Hong Kong's environmental problems are affecting our health.	5.91	0.795	0.818			
It is not urgent to tackle Hong Kong's environmental problems. (recoded)	5.95	0.895	0.848			
Environmental problems are affecting Hong Kong's reputation.	5.93	0.921	0.771			
The current development of Hong Kong is destroying the environment.	5.80	1.005	0.732			

Description	Mean	SD	Factor loadings	Eigenvalue	Variance (%)	Cronbach's Alpha
Environmentally Friendly Personal Consumption [B]	***4.08***			***3.43***	***11.81***	***0.83***
Pay attention to energy-efficient labels when purchasing electronic appliances	4.47	1.544	0.641			
Donate unwanted electronic appliances, computers, toys, or clothes	4.01	1.533	0.679			
Use recycle bins to separate glass, aluminum, plastic, or paper waste	4.12	1.402	0.588			
When shopping choose less packaged types of products or fewer plastic wraps	4.35	1.359	0.622			
Use durable rather than disposable table	4.74	1.309	0.501			
Buy organic food	3.35	1.423	0.682			
Consume sustainable food	3.23	1.553	0.704			
Conscious Consumption of Utilities [B]	***5.04***			***2.58***	***8.91***	***0.73***
Switch off lights when not used.	5.31	1.206	0.747			
Turn off electronic appliances completely	4.79	1.360	0.597			
Turn off taps while brushing teeth, soaping hands, or shaving	5.25	1.348	0.689			
Take shorter showers	4.79	1.283	0.657			
Total percentage of variance					***60.35***	

[A]: Note: Scale of 1 to 7 (1=strongly disagree, 2=disagree, 3=somewhat disagree, 4=neutral, 5=somewhat agree, 6=agree, 7=strongly agree)

[B]: Note: Scale of 1 to 7 (1=never, 2= rarely (less than 10% of them time), 3= occasionally (about 30% of the time), 4=sometimes (about 50% of the time), 5=frequent (about 70% of the time), 6=usually (about 90% of the time), 7=always)

Table 5: Perceived importance of nutritional and sustainability labels on restaurant menus

	Mean	SD	Cronbach's Alpha
Nutritional labels	***4.79***		***0.89***
Provides information about ingredients used when preparing meal	4.59	0.996	
Provides nutritional information for the individual menu item	4.74	1.002	
Offers menu items prepared using healthy cooking methods	4.95	1.091	
Offers low-salt options	5.06	1.144	
Offers low-fat options	4.59	1.146	
Offers gluten-free options	5.01	1.086	
Offers low-calorie options	4.91	1.046	
Offers low-carb options	4.49	1.209	
Sustainability labels	***4.65***		***0.82***
Uses ingredients produced in an environmentally friendly way	4.51	0.877	
Uses ingredients from sustainable sources	4.64	0.996	
Uses organic food	4.38	1.080	
Offers vegetarian choices	4.51	1.098	
Uses fairly-traded food products	4.70	1.218	
Provides carbon emission/carbon footprint information	5.13	1.138	

Note: Scale of 1 to 7 (1=not important at all, 2=very unimportant, 3=unimportant, 4=neutral, 5=important, 6=very important, 7=extremely important)

Table 6: Mean factor score comparison of the different segments (n=468)

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	F	p-value
	Healthy spirits	**Healthy environmentalists**	**Environmental hypocrite**	**Health conscious but not healthy**	**Utility saver**	**Indifferent**		
Segment size	**60 (12.8%)**	**112 (23.9%)**	**65 (13.9%)**	**76 (16.2%)**	**77 (16.4%)**	**78 (16.7%)**		
Factors								
Health consciousness	0.385	-0.271	0.158	0.380	-0.237	-0.175	7.822	0.000***
Healthy physical lifestyle	-1.555	0.430	0.493	-0.169	0.096	0.238	62.820	0.000***
Healthy psychological lifestyle	0.675	0.359	0.076	-1.428	0.320	-0.023	72.285	0.000***
Environmental awareness	-0.009	0.646	0.654	0.131	-0.317	-1.282	76.669	0.000***
Environmentally Friendly personal consumption	0.178	0.785	-0.776	0.240	-1.109	0.244	77.904	0.000***
Environmentally friendly utility consumption	0.096	0.161	-1.075	0.217	1.059	-0.665	70.952	0.000***

*** Significant at 0.000 level

Table 7: Comparison of perceived importance of nutritional and sustainability menu labels (n=468)

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	All	p-value	Group comparison
	Healthy spirits	Healthy environmentalists	Environmental hypocrite	Health conscious but not healthy	Utility saver	Indifferent			
Segment size	**60 (12.8%)**	**112 (23.9%)**	**65 (13.9%)**	**76 (16.2%)**	**77 (16.4%)**	**78 (16.7%)**	**468**	**p-value**	
No of female	**40 (66%)**	**60 (53.6%)**	**28 (43.1%)**	**44 (57.9%)**	**39 (50.6%)**	**40 (51.3%)**	**251 (53.6%)**	**.155**	
Nutritional [A] labels	**4.77**	**5.23**	**4.57**	**4.90**	**4.51**	**4.54**	**4.79**	**0.000**	**2,4>1,3,6>5**
Provides information about ingredients used when preparing meal	4.50	5.00	4.42	4.75	4.29	4.35	4.59	0.000	2,4>1,3,6>5
Provides nutritional information for the individual menu item	4.68	5.23	4.63	4.86	4.36	4.45	4.74	0.000	2,4>1,3,6>5
Offers menu items prepared using healthy cooking methods	4.93	5.40	4.65	4.96	4.83	4.65	4.95	0.000	2,4,1>3,6,5
Offers low-salt options	4.93	5.61	4.74	5.26	4.75	4.76	5.06	0.000	2,4>1,6,5>3
Offers low-fat options	4.65	4.95	4.38	4.64	4.34	4.38	4.59	0.000	2,1,4>3,6,5
Offers gluten-free options	5.02	5.41	4.88	5.13	4.74	4.72	5.01	0.000	2,4,1>3,5,6
Offers low-calorie options	4.90	5.32	4.66	5.08	4.61	4.65	4.91	0.000	2,4,1>3,6,5
Offers low-carb options	4.52	4.92	4.23	4.51	4.16	4.37	4.49	0.000	2>1,4,6>3,5
Sustainability [A] labels	**4.50**	**5.11**	**4.45**	**4.73**	**4.42**	**4.40**	**4.65**	**0.000**	**2>4,1,3,5,6**
Uses ingredients produced in an environmentally friendly way	4.37	4.89	4.22	4.66	4.34	4.33	4.51	0.000	2,4>1,5,6>3
Uses ingredients from sustainable sources	4.53	5.04	4.46	4.67	4.53	4.37	4.64	0.000	2,4>1,5,3,6
Uses organic food	4.23	4.88	4.29	4.47	3.97	4.18	4.38	0.000	2,4>3,1,6>5
Offers vegetarian choices	4.30	5.02	4.42	4.47	4.25	4.35	4.51	0.000	2>4,3,6,1,5
Uses fairly-traded food products	4.58	5.17	4.43	4.75	4.58	4.40	4.70	0.000	2,4>5,1,3,6

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	All	p-value	Group comparison
	Healthy spirits	**Healthy environmentalists**	**Environmental hypocrite**	**Health conscious but not healthy**	**Utility saver**	**Indifferent**			
Segment size	**60 (12.8%)**	**112 (23.9%)**	**65 (13.9%)**	**76 (16.2%)**	**77 (16.4%)**	**78 (16.7%)**	**468**	**p-value**	
No of female	**40 (66%)**	**60 (53.6%)**	**28 (43.1%)**	**44 (57.9%)**	**39 (50.6%)**	**40 (51.3%)**	**251 (53.6%)**	**.155**	
Provides carbon emission/carbon footprint information	4.97	5.68	4.86	5.34	4.87	4.77	5.13	0.000	2,4>1,5,3>6

A: Note: Scale of 1 to 7 (1=not at all important, 2=very unimportant, 3=unimportant, 4=neutral, 5=important, 6=very important, 7=extremely important)