Healthy Eating: Market Segmentation and Prediction

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ABSTRACT

Health consciousness motivates people to start healthy eating. China has become one of the biggest countries in consuming healthy food products such as olive oil. This study aims to segment the consumer market in China and to predict consumers' membership according to their attitudes and behaviour towards olive oil purchase. Using 197 usable questionnaires which were collected by intercept technique and convenience sampling method, the data was analyzed using discriminant analysis to complement cluster analysis. Three distinct groups of consumers were identified, with each segment possessing a unique profile in terms of demographic characteristics, attitudes, and purchase pattern. Price appears to be a barrier to all groups, while the low intention of Group 1 may be contributed by their little knowledge about the benefit of using olive oil compared with other oils and their low personal sensory appeal toward the product. This study provides an insight into market segmentation methodology to identify, predict and access the potential target market in China. The resulting segmentation and prediction could produce information that helps the olive oil industry to develop effective marketing strategies in creating market niches for healthy food products.

Key words: Olive oil, attitudes and knowledge, purchase behaviour, subjective norms, cluster analysis, discriminant analysis

INTRODUCTION

Health consciousness creates motivation to improve quality of life and maintain wellness (Gould, 1988; Plank & Gould, 1990; Kraft & Goodell, 1993; Newsom et al. 2005). Such individuals tend to be interested in purchasing natural and healthy food products as food intake is likely to affect their health (Schifferstein & Oude Ophuis, 1998). Past studies note that socioeconomic status plays a role in impacting health concern which influence consumption pattern, and nutrient intake (Giskes, et al., 2004; Monteiro, et al., 2004; Wang et al. 2008). These studies found that socioeconomic status are also strongly related to purchasing power regardless developed or developing countries alike. Research also showed a link between consumer attitudes and purchase behaviour (Goldman and Clancy, 1991; Magnusson et al., 2001, 2003; Tarkiainen and Sundqvist, 2005).

As the rapid development of the economy in China which leads to a higher level of living standard and a change of health consciousness among Chinese, they become more aware of the impact of the quality and nutritional value of food products to their health and often demand imported food stuff for the products have been viewed as high quality products. Despite there is enormous market potential for selling healthy food in China, there is limited research about the link between Chinese attitudes toward healthy food product and purchase behavior. Even less attention is paid to profile Chinese consumer typologies with healthy food purchase, however heterogeneous nature of consumers within the country cannot be underestimated.
Olive oil is chosen as the study context because the demand for olive oil in China is growing rapidly in view of its nutritional and health values (e.g. Thompson, Haziris & Alekos, 1994; Katsouyanni et al., 1994; La Vecchia et al., 1995), as well it contains a wide variety of valuable antioxidants not found in other oils. Statistics of 2011 Beijing International Oil Expo’s ongoing survey show an increase of import olive oil over 70% per year (BIOE, 2011). It is estimated that the amount will be over 100,000 tons in 2011 (Oil China, 2007). However, over 90% of import olive oil is sold in some larger cities only but not popularly used in other parts of China due to the high selling price and weak familiarity with this product. Hence, there is a challenge for the importers on how to identify and access the potential target market. To capture this emerging lucrative market, a better understanding of consumers’ attitude towards the consumption of olive oil and their characteristics is to be of strategic importance for future business.

Focusing on olive oil, the purpose of this study is to segment consumer market in China and to predict consumers’ membership according to their attitudes and behaviour towards olive oil purchase in order to provide empirical insights into market segments for tailoring customized offerings and improving customer value. The information helps the olive oil industry to develop effective marketing strategies in creating market niches for healthy food products.

LITERATURE REVIEW

The choice of variables is crucial to the success of segmenting consumer market (Souiden, 2002). Hofstede, Steenkamp and Wedel (1999) argue that using macro-economic criteria for segmentation overlooks consumer heterogeneity within country. In contrast, micro-individual variables are more dynamic to reflect the change of the global market (Hassan, Craft and Kortam, 2003). Hence, the study adopted the latter so that variables for segmentation were identified through the study of consumer behavior theories.

The theory of planned behaviour is commonly used in explaining the purchase intention of food, for example: Organic food (Chen, 2007), genetically modified food (Townsend & Campbell, 2004), and so forth. The theory indicates that intention is the best predictor of behavior, such as purchase (Ajzen, 1991). Intention is determined by three factors which are attitudes, subjective norms and perceived behavioral control. Attitudes are considered as personal beliefs that accumulate over his/her lifetime. Subjective norms denote a belief about what others will think about a particular behaviour. In other words, subjective norms exert a perceived social pressure from people who are important to the consumer, such as: family and friends, to engage in the purchase. Perceived behavioral control refers to consumer perceptions of the ability to perform a given behaviour. People’s behaviour is influenced by their confidence in their ability to perform. Self-efficacy beliefs can influence choice of activities, preparation for an activity, effort expended during performance, as well as thought patterns and emotional reactions. Perceived control covers the effects of external factors like time, money, availability and recognition whereas the perceived difficulty deals with consumers’ skills and the abilities to influence the degree of personal control over the behaviour in question (Ajzen, 2002). In general, a more favorable attitude and subjective norm, related to a greater perceived control, and a stronger intention to perform the behaviour in question.

According to Furst et al., (1996), there are other factors that affect the attitude toward food purchase. These factors can be grouped into three components: life course (e.g., influences from past experiences, current trends and future events), influences (e.g., availability of products, household food roles, income level, and mood, etc.) and personal system (e.g., convenience, health, quality, perceived worth of food, and sensory perception, etc.). The life course focuses on the family, social, cultural and physical environment, so it means it depends on each person. With these
environment factors, it influences the ideals, personal factors, resources, social framework and also
the food context which change among the country where people live. These influences take into
consideration conscious value negotiations and unconsciously operationalized strategies which
inform about people’s personal systems, such as concern for health (Tregear, Dent, and McGregor,
1994; Wandel and Bugge, 1997; Magnusson et al. 2001, 2003; Lockie et al. 2002). Health is a
predominant motive for purchasing healthy food products and shaping attitudes (Schifferstein &
Oude Ophuis, 1998). Sensory perceptions are in relation with tastes, smell and so forth. However,
these properties are always in conflict with money considerations.

Past studies suggest that demographic variables and personality traits such as age and gender
are important determinants of consumers’ health orientation, nutrition information interest which
subsequently influence the purchase intention of food products. For example, people above 35 years
old are more knowledgeable and concern about their health whereas younger people are more
sensitive to the appearance and time to cook the food product (Bogue et al, 2005). Chambers et al,
(2008) echo this and point out that older people (over 60 years old) are more likely to make food
choice based on health than younger consumers (18-30 years old) who concerned more on price,
food preparation and time. Similarly, International Olive Council reveals that the major olive oil
purchasers in China were those having bigger purchasing power and well-educated (IOC, 2010).
This is consistent with the comment of Devine et al (2006) that income plays a major role on food
choices, where low income families have lack of time and money to eat a healthy diet. On the other
hand, female consumers were more likely to show restraints of certain foods than male due to
concerns with their appearance; but both genders were highly concerned about family healthy diet
(Chambers et al, 2008). Yet, inconsistent findings have also been reported in terms of the impact of
demographic variables on food purchase intention; for example, Datamonitor (2010) found that life
stage, gender, and age are relatively unimportant in predicting purchase intention of olive oil,
compared to attitudes and personality traits.

RESEARCH METHODOLOGY

Focusing on opinion on olive oil from people residing in Mainland China, the underlying
purpose of the research is to segment consumers according to the motivation and attitudes to
consume olive oil. A questionnaire was designed by reviewing the extant literature and the
questions were in the form of statements on a 5-point Likert-like scale, with the term ‘strongly
disagree’ anchored at the lower end and ‘strongly agree’ anchored at the higher end. Respondents
were asked about their attitudes and purchase behaviour as well as health consciousness towards the
use of olive oil (See Appendix). Pretest of questionnaire was carried out with a number of people to
ensure the content validity (Sethi and King, 1994).

A total of 197 usable questionnaires was collected using intercept technique with
convenience sampling method in various districts in Zhuhai which is one of the top 10 cities in
terms of economy in Canton, China. In order to enhance the response rate, a bottle of water was
given to every respondent as an incentive to participating in the survey.

As we were interested in whether there are segments of consumers with different motivation
and attitudes towards olive oil, cluster analysis was used for segmentation of consumers. Before
performing segmentation, internal reliability was catered for by calculating Cronbach’s alpha of the
motivation and attitudes towards olive oil. Then, a two stages cluster analysis was performed.
Based on attitudes and behaviour, hierarchical cluster analysis was carried out to identify relatively
homogeneous groups of cases. Proximities procedure was used to generate similarity measures. K-
means cluster analysis was then conducted to identify the group membership with the optimal
number of groups obtained from the results of hierarchical cluster analysis. Finally, discriminant
analysis was performed in order to predict group membership of consuming olive oil based on the set of variables on attitudes and behaviour.

**RESULTS**

Out of the sample of 197 respondents, 71 were male, 139 from 18 to 40 years of age, 122 were non-degree holders and 156 with monthly income above RMB5,000. There were 100 respondents used olive oil before, of whom 15%, 36%, 49% belonged to Group 1, 2 and 3 respectively.

Apart from perceived difficulty, the value of Cronbach’s alpha of the constructs was either acceptable or marginal acceptable (See Appendix). So the mean score was calculated, and the results of one-sample t-test with test value of 3 show that all the constructs but subjective norm had effect on respondents’ intention to purchase olive oil (Table 1).

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t-statistic</th>
<th>p-value</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective Norm</td>
<td>3.07</td>
<td>.72</td>
<td>1.35</td>
<td>.18</td>
<td>2.39</td>
<td>3.20</td>
<td>3.48</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>4.05</td>
<td>.73</td>
<td>20.44</td>
<td>.00</td>
<td>4.28</td>
<td>3.68</td>
<td>4.39</td>
</tr>
<tr>
<td>Perceived difficulty</td>
<td>1.99</td>
<td>.74</td>
<td>-19.26</td>
<td>.00</td>
<td>1.75</td>
<td>2.51</td>
<td>1.53</td>
</tr>
<tr>
<td>Convenience</td>
<td>3.51</td>
<td>.71</td>
<td>10.21</td>
<td>.00</td>
<td>3.20</td>
<td>3.16</td>
<td>4.23</td>
</tr>
<tr>
<td>Health consciousness</td>
<td>3.80</td>
<td>.59</td>
<td>19.18</td>
<td>.00</td>
<td>3.57</td>
<td>3.74</td>
<td>4.11</td>
</tr>
<tr>
<td>Sensory appeal</td>
<td>3.29</td>
<td>.65</td>
<td>6.26</td>
<td>.00</td>
<td>2.87</td>
<td>3.36</td>
<td>3.58</td>
</tr>
<tr>
<td>Knowledge</td>
<td>3.46</td>
<td>.90</td>
<td>7.29</td>
<td>.00</td>
<td>2.84</td>
<td>3.55</td>
<td>3.96</td>
</tr>
<tr>
<td>Price</td>
<td>2.32</td>
<td>.91</td>
<td>-10.56</td>
<td>.00</td>
<td>1.65</td>
<td>2.40</td>
<td>2.81</td>
</tr>
</tbody>
</table>

The result obtained from hierarchical cluster analysis reveals that three clusters were appropriate for further analysis. K-mean cluster analysis was subsequently performed by setting the number of clusters to three and indicates that 55 respondents (27.9%), 80 (40.6%) and 62 (31.5%) was obtained for Group 1, Group 2 and Group 3 respectively. The distance between group centers was significantly different from each other with 1.72 between Group 1 and 2, 2.39 between 1 and 3, and 1.79 between 2 and 3. Each variable contributed to the separation of the groups (minimum F statistic = 15.05; d.f. = 2, 194).

When comparing the characteristics of the group members by the pattern of their attitudes and behaviour, the group characteristics could be summarized in Table 2.
Table 2 Characteristics of the group members

<table>
<thead>
<tr>
<th>Group</th>
<th>Group size</th>
<th>Demographic</th>
<th>Attitudes and behaviour</th>
<th>Purchase pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55 (27.9% of total sample)</td>
<td>Relatively older &gt; 41 years (33%), secondary school (40%), with income &lt; RMB5,000 (24%), work in manufacturing or construction sector (35%)</td>
<td>Usually scored low in every aspect except “Perceived Behavioral Control”, “Perceived Difficulty” and “Convenience”</td>
<td>Had used olive oil (27%), of which, 4% use only olive oil and 11% will continue to use olive oil</td>
</tr>
<tr>
<td>2</td>
<td>80 (40.6% of total sample)</td>
<td>Middle age 31-40 years (46%), diploma (40%), with income RMB5,001-10,000 (48%), work in retail sector (35%)</td>
<td>Scored in-between the other groups except highest in “Perceived Difficulty” and lowest in “Perceived Behavioral Control”, and “Convenience”</td>
<td>had used Olive oil (45%), of which, 10% use only olive oil and 40% will continue to use olive oil</td>
</tr>
<tr>
<td>3</td>
<td>62 (31.5% of total sample)</td>
<td>Relatively younger &lt; 30 years (31%), degree (60%), with income &gt; RMB10,000 (45%), work in finance, hotel or technical &amp; professional sector (31%)</td>
<td>Scored high in all aspects except “Perceived Difficulty”</td>
<td>had used olive oil (79%), of which, 29% use only olive oil and 76% will continue to use olive oil</td>
</tr>
</tbody>
</table>

The two Canonical discriminant functions shown in Table 3 were significant at 5% level (p-value < 0.001) which means the group means differ, and the first Canonical variables accounted for 65.6% of the between group (explained) variance. Figure 1 shows the Canonical Discriminant functions graphically. These two functions, having a moderate to high correlation between the discriminant scores and the groups were useful for examining the individual contribution of the variables to the discriminant functions.

Table 3 Standardized Canonical Discriminant Function Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Structure matrix</th>
<th>Classification Function Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Function 1</td>
<td>Function 2</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>.602(*)</td>
<td>-.359</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>.465(*)</td>
<td>.348</td>
</tr>
<tr>
<td>Perceived difficulty</td>
<td>.378(*)</td>
<td>.195</td>
</tr>
<tr>
<td>Convenience</td>
<td>.361(*)</td>
<td>.195</td>
</tr>
<tr>
<td>health consciousness</td>
<td>.300(*)</td>
<td>.187</td>
</tr>
<tr>
<td>sensory appeal</td>
<td>.271(*)</td>
<td>-.026</td>
</tr>
<tr>
<td>Knowledge</td>
<td>-.205</td>
<td>.633(*)</td>
</tr>
<tr>
<td>Price</td>
<td>.122</td>
<td>-.464(*)</td>
</tr>
<tr>
<td>(constant)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Largest absolute correlation between each variable and any discriminant function

The correlation (loading) between the variables and the discriminant function was shown in the structure matrix (Table 3). By convention, loading in excess of 0.33 (i.e. 10% of variance) is considered as eligible. As shown in Table 3, the variable “Subjective Norm” has the strongest correlation with Function 1 (0.602), while the variable “knowledge” has high loading on Function 2 (0.633). By using the classification function coefficients shown in Table 3, three classification
scores could be calculated for each new consumer and group membership could be assigned based on the highest calculated classification score.

**DISCUSSION AND CONCLUSION**

This study began with the aims to segment the consumer market of olive oil in China and to predict consumers' membership due to consumer heterogeneity within country. Olive oil consumption among local residents in Zhuhai, China was chosen as the study context for this provides insights into attitude and behavior of different market segments toward natural health product. The study confirms that consumer heterogeneity within country does exist when segmenting the consumer market of olive oil.

Base on consumer attitude and behaviour towards olive oil purchase, this study had identified three distinct groups of consumers through cluster and discriminant analysis. Selection criteria for clustering regarded consumer responses to questions concerning consumption pattern and attitude as well as health consciousness towards the use of olive oil. The three groups were distinct from each other in terms of demographic characteristics, attitudes and behaviour, and purchase pattern. The result confirms the theory of planned behaviour about a more favorable attitude and related to a stronger intention to perform the behaviour. Hence, a range of marketing strategies to target and reach each group effectively may be required.

Regarding consumption pattern, Group 3 has the highest intention to use olive oil whereas Group 1 has the lowest intention. The low intention of Group 1 may be contributed by their little knowledge about the benefit of using olive oil compared with other oils and their low personal sensory appeal toward the product. Product differentiation strategies emphasizing healthy attributes and benefit to the older consumers (Group 1) may be required. Price appears to be a barrier as the means score of all three groups were below the neutral point of 3. One possible explanation is that olive oil is more expensive than the other types of cooking oils that makes it an uncommon commodity even the residents in Zhuhai are having a good job with moderate to high salary.
compared to other regions in China. Pricing at an affordable level would help to expand the market among user and non-user in China.

From a theoretical perspective, this study provides an insight into market segmentation methodology to identify, predict and access the potential target market. In addition, the discriminant model provides a platform for predicting new customer’s group membership according to their attitudes, behaviour and demographic. The resulting segmentation and prediction could produce information which can be translatable into a strategic operable plan in targeting and promoting the benefit of using olive oil. Limitations of the study are that the study did not consider the influence of Chinese culture, and the history of the development of olive oil. Limitation also comes from the respondent bias due to small samples size and non-random sampling methods.

REFERENCE


Datamonitor (2010). *Study on the promotion of consumption of olive oil and olives in the USA and Canada*. Datamonitor.


Appendix 1

Subjective norms (alpha = 0.858)
– The people in my life whose opinions I value would approve me to buy olive oil.
– The people in my life whose opinions I value buy olive oil.
– Most people who are important to me think that I should buy olive oil.
– Most people who are important to me buy olive oil.
– It is expected of me that I purchase olive oil.
– Many people like me buy olive oil.

Perceived behavioral control (alpha = 0.654)
– Whether I will eventually purchase olive oil is entirely up to me.
– I have complete control over whether I will eventually buy olive oil.

Perceived difficulty (alpha = 0.514)
– If olive oil is available in the shops, I could easily buy if I wanted to.
– It is completely difficult for me to buy olive oil.

Convenience of purchase (alpha = 0.765)
– Olive oil can be bought in shops close to where I live or work.
– Olive oil is easily available in shops and supermarkets.

Health consciousness (alpha = 0.677)
– It is important to me that cooking oil contains low animal fat.
– Health issues play an important role for me when I make decision on purchasing oil.
– When making oil purchase, I pay attention to whether the oil contains unhealthy substances.
– I avoid cooking oil containing too much animal fat.
– My family knows that olive oil has effect to keep skin young.
– My family knows that olive oil has the anticancer effects

Sensory appeal (alpha = 0.798)
– Smells nice.
– Taste good.
– Has a pleasant texture.

Knowledge
– I know the benefits of olive oil compared with other kinds of oil.

Price
– Olive oil is not expensive.