Nutritional Content in Snack Food: Consumer Perceptions and Behaviors

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Abstract

People's lifestyles encouraged them to devour the main dish in a short amount of time. It demonstrated the value of snack foods as a source of supplementary energy. To present an example of marketing agro-industry in some healthy snack foods for college student, it was necessary to understand consumer behaviors regarding sugar intake in snacking. The marketers need to understand the customer perceptions and behaviors towards nutritional content in snack foods to create healthy snack food. The aims of this study were: 1) to analyze the consumer perceptions and behaviors of nutritional content in snack food products; 2) to identify dominant factors which affect the consumption of snack food products. The study was conducted on 200 respondents of college students. Snack foods were commonly consumed by college students, who were classified as adolescents, in between substantial meals. Descriptive statistics and Principal Component Analysis (PCA) were performed. Consumer impressions on a preliminary assessment of the nutrition label, which includes sugar components, were determined using descriptive statistics. Furthermore, PCA was performed to identify the main consumer characteristics that affect snacking, allowing the impact of sugar content on snack food consumption. The results indicated that the consumers were concerned enough about eating nutritious meals. Consumers, on the other hand, rarely read nutrition labels. The "benefit" and "wants" factors were the most important elements affecting consumer snack food intake. The nutritious composition of snack foods, on the other hand, did not affect snack food consumption. The consumers were unconcerned about the sugar content in snack food.

Keywords: *consumer behaviors, consumer perceptions, nutritional content, snack foods*

1. INTRODUCTION

Snack food is described as a portion of food consumed in little amounts or in between main dishes. These snacks were frequently consumed to satisfy hunger, to accompany a friend to work, or simply because they wanted to. Snacking behavior began with hunger, or at least the desire to eat (Bilman, et al., 2010). Initially, the snacks might be consumed in place of larger meals. People with busy lifestyles were forced to devour substantial meals quickly, but the fast-food as the main dish was rich in calories and unhealthy. Thus, snack food provided the possibility for snacking as a source of extra energy (Nielsen, 2014).

Sugar is a nutrient that the body needs as a source of energy. Snack intake was linked to the amount of sweet and pleasant meals consumed, as well as fruit consumption (Hartmann, et al., 2013). The high sugar content can be found in foods, such as cereals and biscuits. Sugar consumption at low levels has no effect because the body requires sugar. However, excessive sugar consumption makes the body sick and can even cause headaches and stomach discomfort (Ettingoff, 2014). Obesity was caused by high snack food intake among adolescents, so snack food selection must be controlled (Sharps, et al., 2018).

According to statistics from Statistics Indonesia (BPS, 2013), ready-to-eat food and beverage consumption was second for 27% of total calorie consumption in the Special Regional of Yogyakarta (Table 1). Ready-to-eat food was food that has gone through a processing process and can be directly consumed without reprocessing. The packaged snacks, the object of the study, were classified as ready-to-eat foods. Thus, packaged snack food had a relatively high level of consumption.

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Table 1. Food Categories Based on Calories

Food Categories	Calories (kcal)	%
Grains	736	36.51
Processed food*	539	27.00
Fat and oil	207	10.35
Drink ingredients	111	5.54
Others	<100	20.60

*ready-to-eat food and beverage consumption
Source: Statistics Indonesia (BPS, 2013)

The snack food industry was considered to have strong enough potential to compete. The snack food industry, with an agro-industry base, could provide an attractive offer to consumers in the form of a healthy and delicious product for consumption. Hess et al. (2017) stated that in a 100-calorie serving, the healthy snack foods include high levels of nutrients, such as protein, calcium, potassium, vitamin D, and magnesium, and low amounts of nutrients to restrict (saturated fat, total sugars, and sodium). A consumer's perception will affect the consumer's desire to buy a product. Perception occurs when consumers try to assess the goods or services to be consumed. The behavior would affect consumers' decisions to purchase goods or services. It will be beneficial for the snack food industry to develop its products according to the consumer's demand.

Consumers were unaware of the contents shown in grocery items, especially the sugar amount, according to Diwakar et al (2019). Adolescents had a broad understanding of healthy snack choices (Bucher, et al., 2016). In addition, students tend to prefer to consume light meals rather than large meals. Although the types of snack food consumed at home and away from home were similar, the quantity of added sugars, saturated fat, and salt consumed at home was higher than that consumed away from home (Casey, et al., 2021). College students, who were categorized as adolescents, frequently consumed snack items in between major meals. Thus, the study was needed to analyze the consumer perceptions and behaviors of college students.

The aims of this study were: 1) to analyze the consumer perceptions and behaviors of nutritional content in snack food products; 2) to identify dominant factors which affect the consumption of snack food products. The benefit of this research is to provide initial information to the snack food industry regarding the development of marketing strategies, especially for the development of healthy snack products that reduce the amount of sugar in their ingredients. Thus, it was necessary to know the perceptions and behavior of students when choosing and consuming snacks.

2. MATERIAL AND METHODS

The object of the study was snack food. Snack food consumption was investigated using a survey method by assessing the perceptions and behaviors of the respondents. The population of respondents in this study was college students who consumed snacks. The survey was conducted on 200 respondents, with 50 respondents each for each cluster using the quota sampling method. The student clusters were health, agriculture, science and engineering, and social clusters. Purposive sampling was also used in this study to determine the intended respondents, namely a group of students who consumed snacks at least once a day. The purpose of providing these conditions was to find respondents who actually consume snack foods.

The survey was conducted using a questionnaire that was divided into two parts, namely open and closed questions. In the first part, the questionnaire contained open-ended questions related to snack consumption. Then, the second section contained closed questions using a Likert scale. The questionnaire variables were prepared based on preliminary interviews and literature studies by Kardes, et al. (2011). The variables were classified based on consumer behavior according to Kardes, et al. (2011). The reliability and validity of the questionnaire were conducted using Cronbach's alpha and Pearson Product-Moment Correlation Coefficient, respectively. The results indicated that the Cronbach's alpha value for the questionnaire was 0.88. Based on the results of the validity test, the Corrected Item-Total Correlation value of variables were more than the r-table value. Thus, the questionnaire was reliable and valid.

The results of the survey were processed by two different methods. The descriptive statistics was used to determine the consumer perceptions for the initial assessment of nutrition labels, including the sugar content. The method was done by selecting the percentage of answers from each variable that represented the consumer perceptions. The Principal Component Analysis (PCA) method was used to determine the main factors of snack food consumption so that it can be seen the influence of sugar content factors in consuming snacks. The PCA was done by analyzing the factors and identifying the relationship between variables by doing a correlation test. Then, it will produce new variables that will represent many previous variables. The variables were arranged based on preliminary studies and literature studies. The variable testing was carried out using the Bartlett test of sphericity and Measuring of Sampling Adequacy (MSA) to test whether the variables involved are correlated. According to Santoso (2010), the main steps in factor analysis were presented:

1) Determine the variables.
2) Test the variables using the Bartlett test of sphericity method and measure the Measure of Sampling Adequacy (MSA). At this stage of factor analysis, a number of variables were categorized to obtain variables that met the requirements for analysis.
3) The factoring procedure extracted one or more factors from variables that pass the preceding variable test.

3. RESULTS AND DISCUSSION

3.1 Demographics of The Respondents

The respondents had an age range between 17 to 26 years. The majority of students were 21 years old with a total of 53 respondents (26.50%). Based on gender, there were 86 male respondents with a percentage of 43%, and 114 female respondents (57%). The majority of the respondents have an average consumption of once a day (45.00%; n=90) and twice a day (30.50%; n=61), while others have a percentage of less than 20% (n=49). Based on the types of snacks that were often consumed, the respondents were asked to choose one of the 12 categories of snacks. Respondents had the majority consuming snack food in the potato chip category with a total of 58 respondents (29%), sandwich biscuits with 38 respondents (19%), and wafers with 20 respondents (10%). In contrast, others had a percentage of less than 10%.

3.2 Consumer Perceptions

The consumer perceptions of snack food in the study were divided into two types. The first was the consumer perceptions of the healthy snack category, while the second was the perception of healthy food with a focus on nutrition labels and sugar content. Table 2 shows the consumer perceptions categories of healthy snacks.

Table 2. Perception Categories of Healthy Snacks

Snack Food	Percentages (%)	Categories
Candy	58.50	Unhealthy
Chocolate bars	41.50	
Potato chips	38.00	
Wafer stick	54.50	Neutral
Wafer	54.00	
Extruded snack	47.00	
Cassava chips	39.50	
Snack bar	55.00	Healthy
Kuaci (sunflower seed snack)	54.50	
Biscuit sandwich	44.50	
Nuts	43.50	
Crackers	43.00	

Candy, chocolate bars, and potato chips were deemed to be unhealthy snack groups by the consumers. They were neutral towards the snack category in the form of wafer sticks, wafers, snack extrude sticks, and cassava chips. Consumers did not select snack food based on whether they were healthy or

unhealthy, as seen by their neutral attitude. Later, the consumer rated snack bars, kuaci, sandwich biscuits, nuts, and crackers as healthy.

The consumer chose the natural ingredients as a factor of consideration as much as 33% (n=65), and the total fat content was 37% (n=74). The results show in Table 3. Based on these results, the total fat content was considered in determining healthy snack food, so did the natural ingredients.

Table 3. The Consideration in Determining Healthy Snack Food

Factor	Percentage (%)
Total energy	19
Natural ingredients	33
Total fat	37
Total Carbohydrate	12

It was considered less in accordance with the content of existing snack food if it was adjusted to the specifications of healthy snacks, namely a fat content of less than 3 grams per 100 grams. Based on the initial survey, the snack food has a total fat content of less than 3 g per 100 g, which was still within an acceptable range. Snack food, such as chocolate bars, potato chips, and cassava chips, have surpassed the established healthy eating limit.

The consumer perception was divided into four factors. The factors were concerned about healthy food, knowledge about nutrition, concern about nutrition labels on packaging, and intensity of nutrition label observation. The perception factor regarding the concern for healthy food was investigated with two variables, such as a yes or no question.

The first variable indicated that the consumers did not think that the snack food containing a lot of sugar would have a good taste (57.50%; n=115). They tend to have the perceptions that delicious snacks have nothing to do with the high sugar content. In terms of healthy food, the consumers tend to understand that a lot of sugar content in snacks was not very popular. The nutrition labels on snack packaging enhanced the perception of health without reducing the food's (Wang, et al., 2016).

The knowledge factor of nutrition has been investigated. The results showed 80% (n=160) of respondents thought that the consumption of snack food containing sugar could increase energy intake. They thought that consuming snacks containing sugar could increase their energy intake. Thus, sugar can be digested by the body and burned into energy.

Most of the consumers (80.50%; n=161) agreed that the consumption of low-sugar snack food can maintain sugar levels in the body. The consumers perceived that consuming low-sugar snack food can maintain blood sugar levels. The excessive consumption of snack food will result in excess sugar being digested by the body. As a result, blood sugar levels will increase. The consumers perceived that the consumption of snack food will better maintain blood sugar if the products consumed have low sugar levels. Likewise, snack food were unhealthy from many perspectives due to their high fat and sugar content, as well as their lack of nutrients (Naqvi, 2015).

Most of the consumers (61%; n=122) rarely pay attention to the nutrition label. On the other hand, the consumers perceived that the nutrition label was important (60%; n=120). Based on those results, the consumers in the health cluster considered that nutrition label was important to include, but they were not much different from consumers who stated that nutrition labels were very important to be included on snack packaging.

According to the knowledge factor of nutrition, 62% (n=124) of the respondents thought that the nutrition labels influence the consumers to choose snack food. The information on the nutrition label was an important consideration in choosing which snack food to consume. Later, 71.50% (n=143) of the respondents agreed that the nutrition label listed on the package was the number of nutrients in a pack of snack food. Thus, the consumers did not understand the information on nutrition labels. The nutrition label includes the nutrient content per serving, not in one pack of snack food.

3.3 Consumer Behaviors

In the initial test, the results of the Bartlett Test, namely Kaiser-Meyer-Olkin (KMO) of 0.854, were obtained. The value of Measure of Sampling Adequacy (MSA) was obtained for each variable was

greater than 0.5, so the test can be continued. The extraction value for communalities has met the requirements, the value ws greater than 50%, so it can be said that each variable can explain the factors more than 50%. The KMO calculation for each variable also met the requirements of more than 0.50. The value was obtained from the anti-image matrix which means that each variable has a strong relationship and can be tested and analyzed further. The primary factor was obtained by the presence of eigenvalues which have a value of 1. The value became the requirement for the formation of the primary factor for grouping the variables. The factor formation will stop when the extraction value of the loading factor is less than 1, which indicates the limit of the eigenvalues.

The results show in Table 4. There were eighteen variables related to consumer behaviors when consuming snack food. Those variables grouped to five factors. The factors explained the consumer habits in choosing snack food.

Table 4. Variables and Factors of Consumer Behaviors

Variables	Factors
The purchased snack food must have a low price.	Price
The consumed snack food was inexpensive.	(X_1)
Choosing snack food with proper nutritional information	
Paying close attention to the ingredients in snack food	
The consumed snack food was beneficial to the body's wellness	Nutritional
The sugar level was one of the factors to consider while selecting snack food	content
The snack food had a proper nourishment	(X_2)
The snack food had a low sugar level	
The snack food had a proper portion size	
Eating the snack food to relieve hunger	Benefit
The snack food was consumed to boost energy intake	(X_3)
The snack food was consumed because it was tasty	
The snack food did not have a bad odor	Product (X_4)
The snack food must be clean	
The easy-to-find snack food was preferred	
Trendy snack food was preferred	
Snack food was eaten as a break between larger meals	Wants
Snack food can be used to substitute substantial main dishes	(X_5)

The first factor that most influences consumers was the "price" factor with two variables. The second factor was "nutritional content" with seven variables. Later, the third factor was "benefit" with two variables. Another factor that influences consumer behavior was the "product". Also, the last factor was the "wants".

The influence of the consumer behavior factors (X1, X2, X3, X4, X5) on the frequency of snack eating was investigated using a t-test (Y). The "benefit" and "wants" categories had a significance value of less than 0.05, according to the findings. This demonstrates that these variables have an impact on snack food consuming frequency. Table 5 shows the significance of t-test on the dependent and the independent factors.

Table 5. Significance of T-test

Factors	Significance
Price	0.22
Nutritional content	0.64
Benefit*	0.00
Product	0.29
Wants*	0.01

*had a significance value of less than 0.05

The two factors had a significant impact on the frequency of snack food consumption. Based on the variables of "benefit", the snack food was consumed with the intention of providing a feeling of

fullness and enhancing energy. Those purposes were to experience the benefits of snacking in order to successfully meet the body's nutritional requirements. Snacking behavior involved the ability to strike a balance between lessening hunger and the time spent waiting for the next meal (Bilman, et al., 2010). Also, the consumers were more likely to eat popular snacks. It was encouraged by the development of the era, which has resulted in a wide variety of snack options. Furthermore, the customers tended to have snack food in between meals or even to substitute meals entirely with snack food.

3.4 The Nutritional Snack Foods Consideration

The nutritional value of snack food, on the other hand, was not a factor in snack food consumption. The consumers were unconcerned about the sugar content in snack food. The consumers were less concerned about nutrition, particularly when it came to sugar intake. The low sugar content of snack food was not a factor in the snack food selection. The "nutritional content" factor included the consumer behaviors relating to these items. The significance value was greater than 0.05, indicating that this factor had no influence on the snack food intake frequency. As a result, the consumer behavior demonstrated a lack of concern for selecting nutritious snack food, preferring instead to consume it to satisfy satiety and only to the level of desire.

Consumers were unconcerned about the sugar content in snack foods. Also, they were less concerned about nutrition, particularly when it came to sugar intake. Consumers desired trending snack foods as a substitute for a substantial main dish to improve energy consumption, although they were ignorant of the sugar level. On the other hand, the snack foods sector might develop nutrient-dense snacks that were high in energy but low in sugar. Due to consumer concern about packaging, the snack foods business may be able to persuade customers by producing appealing packaging that shows healthy snack foods and conveys information about their ingredients.

The total energy requirement based on the Nutrition Adequacy Rate (RDA) for ages 19-29 years were 2,72 kcal for men and 2,25 kcal for women (Ministry of Health Republic of Indonesia, 2013). The students have this age range and were assessed as having calories needed according to the RDA. If it was assumed that in one large meal, students have an intake of 600 kcal, the consumption of large meals three times a day still did not meet the nutritional adequacy. For this reason, additional snack foods were needed to meet the energy needs of the students.

For healthy snack food, the fat content must be less than or equal to 3 per 100 grams, sugar must be less than or equal to 5 per 100 grams, and salt must be less than or equal to 0.30 per 100 grams (Hinton, 2014). The energy requirements derived from these snack foods, however, must consider the nutrients in the snacks. To satisfy their energy needs, the students must pick the snack food based on their nutritional adequacy.

4. CONCLUSIONS

The consumers perceived that they care enough about healthy foods, understand the nutrients that the body can use from sugar consumption in snacks, and were less concerned about nutrition labels because the level of observation and importance of nutrition labels was low, and consumers were quite intense in observing nutrition labels. Although, the consumers rarely pay attention to nutrition labels. The dominant factors influencing the consumption of snack food by the consumers were the "benefit" and "wants" factors. The snack foods nutritional content, on the other hand, had no influence on snack food intake. The consumers were indifferent about snack food's sugar levels. The consumers cared less about nutrition, especially when it came to sugar consumption. Consumers preferred to eat trendy snack foods to boost energy intake as a substitute for the substantial main dish but were unaware of sugar content. On the other hand, the snack foods industry could develop nutritious snack foods that could boost energy but had low sugar content. Due to consumer concerns about packaging, the snack foods industry may be able to persuade customers by developing appealing packaging that depicts healthy snack foods to convey information about the contents of healthy snack foods.

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