Factors affecting milk consumption among school children in urban and rural areas of Selangor, Malaysia

Babolian Hendijani, R. and *Ab Karim, M. S.

Department of Food Service and Management, Faculty of Food Science and Technology Universiti Putra Malaysia, Selangor Darul Ehsan, Malaysia.

Abstract: The aims of this research were to investigate the present beverage choice preference of school children and to examine the most preferred type of milk that is available in the market. As well as to determine the effect of personal and environmental factors on children's intention to consume milk and its comparison between rural and urban area of Selangor. A total of 389 of 5th grade primary school children were selected in this study. This research was supported by social cognitive theory. Multiple linear regression, Pearson product-moment correlation, and cross-tabulation were used for forecasting the factors affecting to consumption of milk. It was found that the preferred beverages of children were: Mineral water, Milo, fruit juice, milk, yoghurt, Ribena, tea and soft drinks and it was the same amongst children in urban and rural areas. Among different types of milk, children preferred flavored milk rather than plain milk. Based on the findings, personal factors were more effective than environmental factors. To increase milk intake among children, marketers need to focus and strengthen the acceptability of milk and increase consumption by altering perception of milk advertisements. This article also profiled the children who are likely to drink milk based on personal and environmental factors in different areas.

Keywords: Milk consumption, preference, urban, rural, Malaysia

Introduction

There is a growing change in the food and drinks market. These changes are based on the transformation in the structure of population, consumer attitudes, and their intentions towards the products (Charlet and Henneberry, 2002). Understanding the requirements of different segments of the population help us to realize the different sets of consumers and their consumtion preferences. The key driving forces within the food and drink segment have been and will remain: health benefits of food (Hartog *et al*., 2006; Grunert *et al*., 1996), value of food (Alden, 2007; Miles and Frewer, 2001), how the food is manufactured, convenience and suitable packaging (Hoyer and MacInnis, 1997).

As we know, consumers' standards of living are factors effecting the changing lifestyles and worldwide trends. The number of residence in urban areas increased compare with those in the rural area and there is an increase in family household incomes (Kowtaluk and Kopan, 2004; Regmi and Dyck,

2001). The tendencies such as socio-demographic changes (Warwick *et al*., 1996), consumers' health consciousness (Hartog *et al*., 2006), level of knowledge and household income have increasingly effecting this market (Churchill and Brown, 2007). Those changes have revealed an increase in demand for healthy food or diet food, particularly milk and dairy products. Previous research stated that an increase in consumers' income, population growth, price changes, urbanization and changes in food patterns and lifestyles have contributed to boost the dairy production (Pingali, 2004)

For the consumption of milk in the daily diet, it is important to find the association between personal and environmental factors with intention to consume milk and therefore helpful decisions and strategic planning can be made for the dairy market. For better understanding of the market, some similar researches have been conducted to find the relationships between physiological needs, food preferences, parental offers, peer force, media, social norms and personal attitudes (Kowtaluk and Kopan, 2004). Dairy products

Corresponding author.
Email: *shahrimkarim2@gmail.com*
Tel: +603-89468409; Fax:+603-89423552

are the best biologically utilized source of calcium (Charles, 1992). Hence, increasing the consumption of milk is the best way to increase dietary calcium intake level among children. Malaysians consume more dairy products compared to other Southeast Asian countries. Additionally, this is due to growing urbanization coupled with increasing household income (Dong, 2005).

Therefore this research attempted to analyze factors effecting children's intention to consume milk in urban and rural areas of Selangor. Besides this research, was conducted to investigate the present beverage choice among children and to examine the most preferred type of milk of this group. To achieve the purposes of this research, marketing actions, environmental and personal factors variables were applied.

Materials and Methods

A quantitative method was used in this research to analyze the effect of social and environmental factors on intention to consume milk among 5th grade school children in urban and rural areas of Selangor. The research was conducted from August to September 2008. A questionnaire was designed to answer three main objectives of this research. The questionnaire was divided into four sections: personal factors, environmental factors, intention to consume and socio-demographic information of the respondents.

In the process of developing the questionnaire, a pre-test was conducted. A total of 23 questionnaires were distributed during the pre testing. The participants were asked to fill up the questionnaire which was translated into Malay language. Pictures were also used in the questionnaire so that it could be understood by the school children. This study focused on children age 11 years old in primary school at selected towns in urban and rural areas of Selangor. This specific age group was previously studied by researchers Chaudhari and Marathe (2007), and Wind, (2006). This age matches with a critical period of the lifetime. Major physical, psychological and emotional changes are taking place and the need for a nutritionally adequate diet is of paramount importance for optimum growth and development (Johnson and Hackett, 1997). Only 11 years old were chosen for this research because children of this age have been found to be active and independent shoppers (McNeal, 1992). These children are found to have an understanding of their consumption patterns (Belk *et al.*, 1982); and highly knowledgeable about products and brands (Ward *et al.*, 1977). The children can use their pocket money to choose whatever food

they want at lunch time and also to buy snacks during and after school. Many other factors that influence the actual choice made as well, for example, peers (Thomas, 1991), the sensory quality of the food (Shepherd, 1992) and advertising (Dibb, 1993).

The conceptual framework and hypothesis

Figure 1 shows the conceptual framework of this study. The framework was extracted and modified from the Social Cognitive Theory based on Bandura (1997). Behavioral theories, like Social Cognitive Theory (SCT), present a framework for understanding health behavior and can direct the variety of potential determinants. In this framework, the main selected attributes for intention to consume were intrinsic factors (attitude, belief and consumption pattern) and extrinsic factors (social environment and physical environment).

Sampling method

The data was gathered by using self-administrated questionnaire. The school children completed their questionnaires in the classroom during school hour or in the canteen during lunch break and were supervised by the teacher, who had received instructions from the researcher. The survey took around 15 to 20
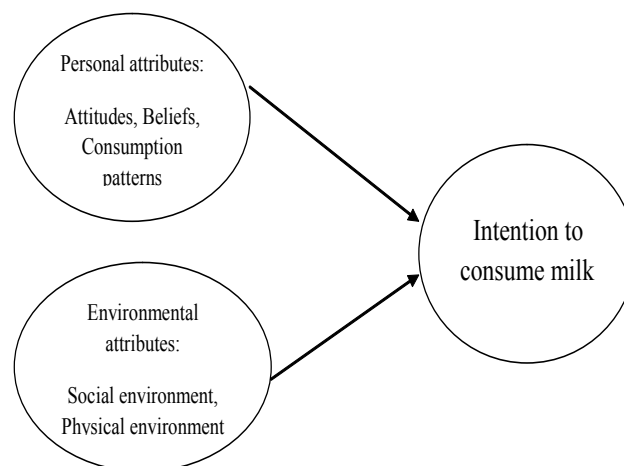

Figure 1. Conceptual Framework of the Study

minutes to be completed. The locations were Klang, Shah Alam, Petaling Jaya, Subang in the urban area and Dengkil, Sepang, Kapar, and Banting in the rural area.

The schools were chosen conveniently among all of the schools based on the population of students on selected districts. The students were selected on convenience basis, whereby questionnaires were given to children whom were chosen based on the list of the school. This method was chosen due to large number of students in the province

Statistical analysis

Data was analyzed by using statistical techniques obtain from the SPSS version 15.0 software. The statistical method applied in this study was frequency distribution, cross tabulation, Pearson product-moment correlation coefficient, and multiple linear regression. The reliability test shown that the Cronbach's Alpha value was 0.772 for 36 attributes tested. The attributes were the statements based on each of the variables studied. It showed that the scale of the constructs was highly reliable.

Results

Preference choice of drink

This research tried to identify and rank the most preferred beverage on eight different occasions and to see where milk is positioned. Table 1 indicates that the preferred type of drink that children normally spend their pocket money.

Most of the children's pocket money was between RM1 to RM2 per day and they indicated the preference to spend their money on their favorite drink rather than milk. They were aware of health benefits of milk, but did not have the urged to spend their money for milk. In conclusion, the results in Table 1 shows that: 1) the ranking of popular beverages as listed, between urban and rural school children appeared to be similar; 2) milk appeared only as the fourth most liked beverage for both groups; 3) most of the school children indicated their willingness to spend more than RM 2 to buy milk than to buy their favorite drink – drinking water, Milo, fruit juice (i.e. other than milk).

Preferred Type of Milk in Urban and Rural areas

The finding in Table 2 shows that flavored milk especially with chocolate taste had the potential to increase the children's milk consumption at school or home. Chocolate was the preferred flavor, and although unflavored milk was available, it was typically the least popular. This study was also supported by previous research (Murphy et al., 2008; Johnson, 2002).

Multiple Linear Regression among Items in Rural and Urban areas
Personal Factors in the Rural area

This research conducted the regression analysis for two independent variables which included eight items on the intention to consume milk. The multiple linear results for the first independent variable are described as follows. Table 3 shows the regression between personal factor items with intention to consume milk.

The R square (Coefficient of determination) was 0.353, which means 35.3 % of the total variance in this dependent variable, could be explained by these items as shown in the above model. The F-ratio of 8.202, significant at $P<0.05$, shows that the model fits the data.

The final regression equation model is measured as follows:

$$\acute{Y} = 0.736 \text{ Attitude} + 0.105 \text{ Belief} - 0.112 \text{ Packaging} + 0.405 \text{ Consumption patterns}$$

The regression equation with four personal predictors was significantly related to intention to consume milk, $F(4, 60) = 8.202$, $\rho=0.000$. By using unstandardized coefficients, for every one unit increase in the attitude, there is a 0.736 unit increase in the intention to consume milk, while keeping other variables constant. However, when using Beta to interpret the results, Attitude (Beta= 0.374) had the highest influence on intention to consume milk. By increasing one unit in Belief, there is a 0.105 unit increase in the intention to consume, if keeping other items constant. It means for one unit increase in intention to consume, attitude to packaging decreases by -0.112 unit. Based on results in Table 3, packaging had the lowest effect among the items. If one unit increases in consumption pattern, 0.402 unit will be increase in the intention to consume.

For this equation, attitude to sensory properties of milk ($t(60) = 2.857$, $p<.05$), belief in health benefits of milk ($t(60) = 0.644$, $p>.05$), interesting packaging ($2(60) = -0.859$, $p>.05$), and consumption pattern ($t(60) = 2.519$, $p<.05$) are all significant predictors of intention to consume milk. So based on the data, belief in health benefits and packaging of product had no significant effect on intention in rural the area. From the magnitude of the t-statistics, we can see that the attitude to sensory properties had the greater effect followed by consumption patterns and belief in health benefits.

Environmental factors in the rural area

Based on Table 4, we can interpret the second independent variable of this research. The R square was 0.236 which means that, 23.6% of the total variance in the dependent variable could be explained by this independent variable. The F-ratio was 4.631, significant at $P< 0.05$ shows that the model fits the data.

Table 1. Ranking the preferred type of drink

Rank	Drink	Urban%	Rural%
1	Drinking water	71.3	64.6
2	Milo	65.1	52.3
3	Fruit juice	58	41.5
4	Milk	51.9	40
5	Yoghurt	46.6	29.2
6	Ribena	41.4	21.5
7	Tea	28.1	15.4
8	Soft drink	14.8	4.6

Table 2. Type of milk preferences which is available in market in rural and urban areas

Type of milk	Total preference %	Urban area %	Rural area %
Plain milk	40.1	40.7	36.9
Chocolate milk	65.8	69.8	46.2
Strawberry milk	42.7	45.4	29.2

Table 3. Regression of personal factors in the rural area

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.595	.353	.310	.82099

Predictors: (Constant), Attitude, belief, packaging, consumption pattern

Analysis of variance (b)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.112	4	5.528	8.202	.000[a]
	Residual	40.441	60	.674		
	Total	62.554	64			

a Predictors: (Constant), attitudes, belief, packaging, consumption patterns
b Dependent variable: intention to consume

Coefficients[a]

	Model	Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-.553	.924		-.598	.55
	Attitude	.736	.257	.374	2.857	.006
	Belief	.105	.163	.069	.644	.522
	Packaging	-.112	.131	-.096	-.859	.39
	Consumption pattern	.402	.159	.322	2.519	.014

a. Dependent variable: Intention to consume

The final regression equation model is measured as follows:

Ý=0.994+0.235 Family+0.134 Friends+0.441 Availability+ 0.114 Advertising

The regression equation with four environmental predictors was significantly related to intention to consume milk, F (4, 60) = 4.631, ρ=0.003. By using unstandardized coefficients, for every one unit increase in the effect of family members, there is a 0.235 unit increase in the intention to consume milk, while keeping other variables constant. However, when using Beta to interpret the results, family (Beta= 0.227) had the second influence after availability on intention to consume milk. Besides, by increasing one unit in the effect of friends' section, there is a 0.134 unit increase the intention to consume and this shows the effect of family members on children is more than the effect of friends to consume this product. When using Beta to describe the data (Beta= 0.126), they had the third effect among the other items. By increasing one unit in availability, there is a 0.441 unit increase in the Intention to consume milk. When using Beta for analyzing the results (Beta= 0.341), it had the most effect on the intention to consume milk. Advertising had the lowest effect with (Beta= -0.114) among all items. This indicates that if effect of advertising decreases by -0.114 unit, intention to consume increases by one unit. Environmental factors with four predictors can support 23.6 % of intention to consume milk.

This independent variable was composed of: effect of family members (t (60) =1.858, p> 0.05), effect of friends (t(60)=1.055, p> 0.05), availability at home (t(60)=2.792, p< 0.05) and advertising (t (60) = -0.827, p> 0.05). Only availability at home had significant effect on intention to consume milk in the rural area. From the magnitude of the t-statistics we can predict that the availability at home had the most effect on intention to consume followed by family members and friends.

Personal factors in the urban area

The two variables which totally included eight items were regressed on the intention to consume milk in the urban area. The multiple linear results for the first independent variable are described as follows. Table 5 shows the regression between personal factor items with intention to consume milk in the urban area.

The R square (Coefficient of determination) was 0.370, which means 37 % of the total variance in this dependent variable, could be explained by these items as shown in the above model. The F-ratio was

46.701, significant at P < 0.05, and this shows that the model fits the data.

The final regression equation model is measured as follows:

Ý= -0.183+ 0.529 Attitude+ 0.256 Belief- 0.179 Packaging+ 0.421 Consumption patterns

By using unstandardized coefficients, for every one unit increase in the attitude, there is a 0.529 unit increase in the intention to consume milk, while keeping other variables constant. However, when using Beta to interpret the results, attitude (Beta= 0.529) had the highest influence on intention to consme milk. By increasing one unit in belief, there is a 0.256 unit increase the intention to consume, if keeping other items constant. As the effect of packaging decreases by -0.179 unit, intention to consume milk increases by one unit. Based on above table, packaging had the lowest effect among the items. If there is one unit increase in consumption pattern, 0.421 unit will increase in the intention to consume. Personal factors with four predictors can support 37% of intention to consume milk in the urban area.

For this equation, attitude to sensory properties of milk {t(318)= 5.690, p< 0.05}, belief in health benefits of milk (t(318)= 2.971, p< 0.05), interesting packaging {t(318)= -3.233, p< 0.05}, and consumption patterns {t(318)=6.418, p< 0.05} are all significant predictors of intention to consume milk. So based on the data, packaging of product had lowest effect on intention to consume milk in the urban area. From the magnitude of the t-statistics, we can see that the consumption patterns had the greatest effect followed by attitude to sensory properties, belief in health benefits, and packaging.

Environmental factors in the urban area

The Table 6 interprets the second independent variable of this research. The R square was 0.328 which means 32.8% of the total variance in the dependent variable could be explained by this independent variable. The F-ratio of 38.930, significant at p< 0.05 shows that the model fits the data.

The final regression equation model is measured as follows:

Ý= 1.098 + 0.200 Family + 0.186 Friends+ 0.357 Availability + 0.057 Advertising

The regression equation with four environmental predictors was significantly related to intention to consume milk, F(4, 319) =38.930, ρ=0.000. By using unstandardized coefficients, for every one unit increase in the effect of family, there is a 0.200

Table 4. Regression of environmental factors in the rural area

model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.486(a)	.236	.185	.89254

Predictors: (Constant), Family, Friends, Availability, Advertising

Analysis of variance (b)

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	14.756	4	3.689	4.631	.003(a)
	Residue	47.798	60	.797		
	Total	62.554	64			

a Predictors: (Constant), Family, friends, Advertising
b Dependent Variable: intention to consume

Coefficients[a]

Model		Unstandardized Coefficients		Standardized	t
		B	Std. Error	Beta	B
1	(Constant)	.994	.632		.121
	Family	.235	.127	.227	.068
	Friend	.134	.127	.126	.296
	Availability	.441	.158	.341	.007
	Advertising	.114	.137	-.099	.411

a. Dependent variable: Intention to consume

Table 5. Regression of personal factors in the urban area

model summary

Model	R	R Square	Adjusted R Square	Std. Error of The Estimate
1	.608(a)	.370	.362	.84391

a. Predictors: (Constant), Attitude, belief, packaging, consumption pattern

Analysis of variance (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	133.040	4	33.260	46.701	.000[a]
	Residual	226.475	318	.712		
	Total	359.514	322			

a Predictors: (Constant), attitudes, beliefs, packaging, consumption patterns
b Dependent Variable: intention to consume

Coefficients[a]

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-.183	.424		-.432	.666
	Attitude	.529	.093	.294	5.690	.000
	Belief	.256.	.086	.140	2.971	.003
	Packaging	-.179	.055	-.145	-3.233	.001
	Consumption pattern	.421	.066	.327	6.418	.000

a. Dependent Variable: Intention to consume

unit increase in the intention to consume milk, while keeping other variables constant. However, when using Beta to interpret the results, family (Beta= 0.200) had the second influence after availability on intention to consume milk. Besides, by increasing one unit in the friends' section, there is a 0.186 unit increase the intention to consume and this shows the effect of family members on children is more than the effects of friends to consume this product. When using Beta to describe the data (Beta= 0.186), they had the third effect among the other items. By increasing one unit in availability item, there is a 0.357 unit increase in the intention to consume milk. When using Beta for analyzing the results (Beta= 0.357), it had the most effect on the intention to consume milk. Advertising had the lowest effect (Beta= 0.057) among all items. By increasing one unit in advertising, there is a 0.057 unit in increase in intention. Environmental factors with four predictors can support 32.8 % of intention to consume milk.

This independent variable is composed of: effect of family members {t (319) =4.254, p< 0.05}; effect of friends {t(319)=3.458, p< 0.05}; availability at home {t(319)=5.767, p< 0.05} and advertising {t(319)= 1.214, p< 0.05}. Only advertising had no significant effect on intention to consume milk in the urban area. From the magnitude of the t-statistics we can say that the availability at home had the most effect on intention to consume; followed by family and friends.

Implications

This research highlighted factors which had more effect on children's intention to consume milk on two major areas: theoretical and managerial. In terms of theoretical contributions, the research enriched the body of literature of children's intention to consume healthy foods. The findings of this research could provide a foundation for future research in this topic. As such, the main items that contributed and measured might be used for other age groups to develop better understanding on the consumption of this product among Malaysians. This research has a complete analysis of personal, environmental and socio-demographic factors. Similar studies have been done before but in different countries: consumption and attribute perception of milk in Taiwan (Hsu and Lim, 2006), attitude and consumption pattern of milk consumption in UK (Hill and Lynchehaun, 2002). The results of this research outlined that there were two main factors that characterize the children's intention to consume this product. Specifically, the factors were: personal factors and environmental factors.

The items in each of the factors were different for both rural and urban areas. Therefore, comparisons were made between children in rural and urban areas on their intention toward drinking milk. The results of this study showed that attitudes toward sensory properties had the highest effect among other items on children's intention in the rural area, while, in the urban area the highest effect belongs to availability of milk at home. In both areas, advertising had the lowest effect.

From the managerial marketing perspective, this research could assist companies to focus on the items that had more effect on children to consume this product. While milk consumption encompasses only a small part in comparison to all other beverages, the importance of its consumption to the national economy of a country cannot be denied. Marketers who develop more research in milk preferences and consumption behavior of consumers would strengthen this product category. The findings of this research may also illustrate the relation of some factors toward children's intention and will assist companies to determine their target consumers. Besides that, manufacturers can use the information and ideas from this research to further improve their products and to be more competitive in the market. In order to increase the marketability of milk, a few factors need to be addressed. Two keys issues hamper marketers:

1- the need to focus and strengthen the social acceptability of milk in both urban and rural areas

2- that consumers are already aware of the health benefits of milk, the key is to increase consumption by altering perception of milk

There are many ways in which marketers could promote the social acceptability of milk. Advertisers may encourage milk consumption in socially visible setting. Positioning milk to target 11 year olds would pursue a great deal of the population and hopefully increase milk consumption within this age.

The majority of the current research highlights the nutritional health benefits of milk consumption, unfortunately, children are already aware of the health benefits of milk and it is not positively influencing consumption. Altering the focus from a nutritional aspect to one highlighting the social acceptability of milk will create awareness and could promote consumption of milk. This research will also help milk's marketers to know more about the children's intention in the market with evaluating more factors such as sensory properties, convenience packaging, availability at home and advertising. From the information and understanding, marketers can then suggest an effective marketing segmentation

Table 6. Regression of environmental factors in the urban area

model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.573(a)	.328	.320	.87040

a. Predictors: (Constant), Family, Friends, Availability, Advertising

Analysis of variance (b)

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	117.974	4	29.494	38.930	.000(a)
	Residue	241.675	319	.758		
	Total	359.649	323			

a Predictors: (Constant), Family, friends, Advertising
b Dependent Variable: intention to consume

Coefficients[a]

Model	Unstandardized Coefficients		Standardized	t	Sig.
	B	Std. Error	Beta	B	Std. Error
1 (Constant)	1.098	.219		5.017	.000
Family	.200	.047	.218	4.254	.000
Friend	.186	.054	.181	3.458	.001
Avalability	.357	.062	.311	5.767	.000
Advertising	.057	.047	.059	1.214	.226

a. Dependent Variable: Intention to consume

in marketing the milk through better focus on their needs. Marketers need to focus and strengthen the social acceptability of milk as replacement beverages for soft drinks and position themselves as beverages consumed while in the company of friends and social gatherings.

Conclusion

Since the research was investigative in nature, future research should focus on how to refine the methods employed in their study. However, the results of the research somehow confirmed that there were significant correlations between social and physical environment with intention to consume milk in both rural and urban areas. It was also proven that advertising as a type of information source was not important in determining children's intention to drink milk in both urban and rural areas. As we are living in a technological global village and most of children exposed to advertising every day, it should be the most important source of information for them. The comparison by residence in this research demonstrated given higher values to milk in the urban area compare with the rural area. Since milk is seldom practiced as a healthy food among Malaysians, its consumption is low. In addition the low milk consumption were

due to the existence of competing drinks, effect of packaging, sensory properties, belief to health benefits, effects of family members and friends, availability at home and advertising. Attitude to sensory properties, belief to health benefits of milk, consumption patterns and packaging explained 35.3% in the rural area and 37% in the urban area in the variance of intention to consume milk. Effect of family members, friends, availability and advertising explained 23.6% in the rural area and 32.8% in the rural area in the variance of intention to consume milk. Due to the results, social environment factors were more effective than physical environment factors in urban and rural areas. Future studies should investigate the barriers of children's milk consumption. Such information may be important for the industry in distributing and promoting this product.

More concern about health and quality of life are increasing as well as the consumption of juices and soft drinks. Flavored milk was preferred by children rather than plain milk, therefore, promoting milk with more flavors will help to attract children to consume more and bring this product to their homes. Reduced milk intake and the concurrent increase in children intake of other drinks over time maybe explained in part by parents' attitudes and expectations about consuming milk. Promoting this product directly to

children and their parents may be more influential than towards children alone. Parents may be able to moderate these changes by making healthful food available and encouraging its consumption.

A combination of several factors can increase the consumption of milk in Malaysia. In addition to the identification of new applications for milk, the development of new products and more attractive packaging looks necessary. As Malaysia will be a developed country by 2020, its standard of diet should also be similar to developed countries and the Malaysian government should promote more healthy eating habits. By actively seeking the factors motivating children to consume milk, companies can develop a powerful marketing tool that can bring this product into Malaysian homes.

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