Factors Affecting Milk Consumption Behavior in Vietnam: A Case Study in Long Bien District of Hanoi

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Abstract Frequency of milk consuming has been increasing rapidly, ranked the third, just behind food and spice sauce in Vietnam in recent years. This study aimed to find out which factors impact on the milk consumption behavior of Vietnamese. The data came from standard questionnaires in a survey of 100 representative respondents in a case study in Long Bien district, Hanoi, Vietnam. Results showed that three factors: the average monthly income of the household, education and career of the respondents (also decision makers in milk consumption of the household) had positive and significant influence to consumer behavior of milk consumption. Consumers had a more professional career, higher education levels and higher incomes also consumed milk more often.

**Keywords** factor, milk, consumption behavior.

Introduction

Vietnam locates in the Asia-the most active region, where gains the highest economic growth rate and highest milk consumption in the world [1]. Since 2005, Vietnam has become the second country in Asia whose fast economic growth rate exceeded 8 percent per annum [2]. The high income growth rate has stimulated milk consumption in Vietnam. Vietnam became one of the countries with the highest milk consumption growth rate in the Asia region, just after China. Milk consumption throughout the country went up quickly. Within 20 years from 1990 to 2010, it increased 41 times [3].

Recently, milk has become a preferred choice of Vietnamese in daily nutritional health care. According to the statistical results of recent studies, the frequency of milk consuming in Vietnam ranked the third, behind only food and spice sauce [4]. Which factors affect milk consuming in Vietnam? Is there a relationship between milk consumption with our increasing income? This article aims to analyse and find out the factors and its impact on the milk consumption behavior of households in a case study of Long Bien district, Hanoi, Vietnam.

Methodology
Primary data
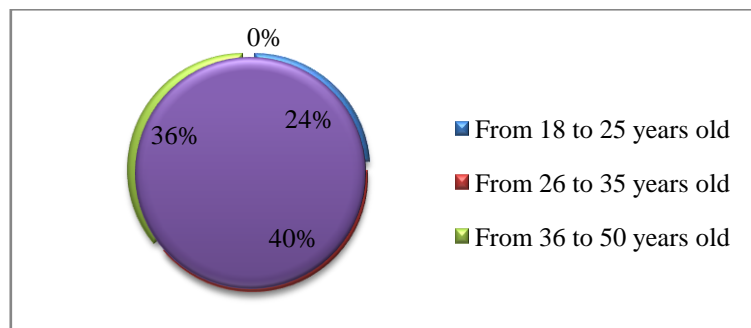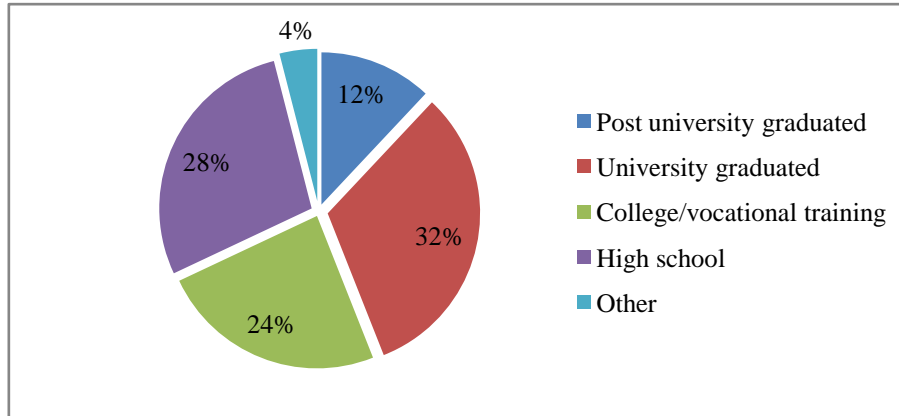

Source: Survey data, 2015

Figure 1: Age of the respondents

Primary data were collected through standard questionnaire, oriented interviews, expert consultation, and in-depth interviews. Firstly, we applied oriented interview, and consulted experts, combined with secondary data to select necessary respondents based on four basic criteria as age, occupation, education and household average monthly income of respondents. We found out100 representative respondents who decided milk consumption behavior of the household level. Then, we used standard questionnaires to collect data.

According to the real situation of Vietnam, we chose 100 women aged from 18 to 50 years old, who played an important role in households' health care, spending and decide to purchase and pay for the milk.

The educational level of the respondents consisted of postgraduates; graduates; college or vocational training; high school; and others (secondary, primary).

Source: Survey data, 2015

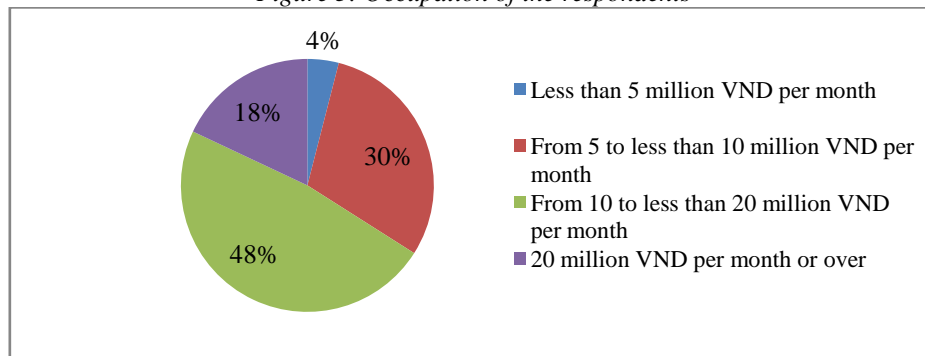*Figure 2: Educational level of the respondents*

About occupation, we chose the popular careers in Vietnam including: government staff; trader/retailer; worker/farmer; unstable job; free job (such as street vendor); housewife; and others.
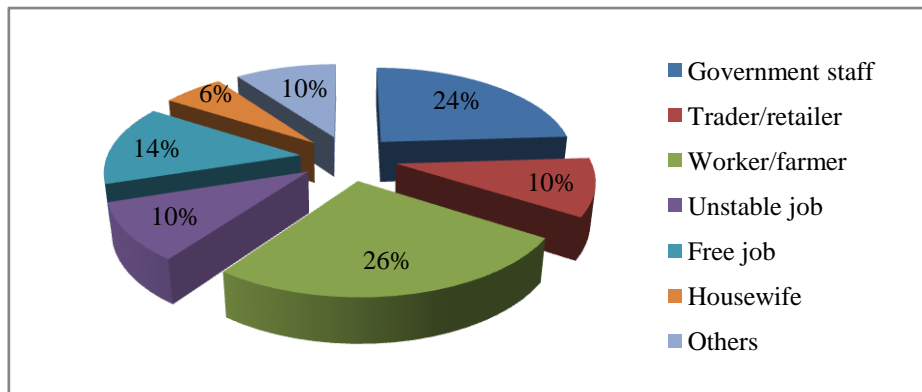
Source: Survey data, 2015

Figure 3: Occupation of the respondents

Source: Survey data, 2015

Figure 4: Monthly household income of the respondents

The average monthly income of the respondents' household included: less than 5 million Vietnamdong (VND) per month; from 5 million to 10 million per month; from 10 million to 20 million per month; more than 20 million.

Method of Data Analysis

The research used OLS regression to computes the effects of some consumers' characteristics of this population ofthe behavior of milk consumption.

The milk consumption behavior equation:

$Y_{1i} = \chi_{1i}\beta_1 + u_{1i}u_{1i}$ ~ N(0,1)

Where Y_{1i} is the latent dependent variable

χ_{1i} is the vectors that are assumed to affect the probability of sampled consumers buy milk

β_1 is vectors of unknown parameter in the milk consumption equation

$u_{1i}$are residuals that are independent and normally distributed with zero mean and constant variance

Table 1: Description of the dependent and independent variables used in the model

Variables	Description	Types	Values
AGE	Age	Continuous	Number of years
EDU	Education level	Dummy	0= postgraduates; 1= graduates; 2= college or vocational training; 3= high school; 4=others
JOB	Career	Dummy	0= government staff; 1= trader/retailer; 2= worker/farmer; 3= unstable job; 4= free job; 5= housewife; 6= others.
INCOME	Average monthly income of household	Dummy	0= household income less than 5 million per month; 1= household income from 5 million to less than 10 million per month; 2= household income from 10 million to less than 20 million per month; 3= others.
Y_{1i}	Behavior of milk consumption	Dummy	0= usually consume milk (more than 5 times/days per week) ; 1 = often consume milk (4-5 times/days per week); 2= sometimes consume milk (2-3 times/days per week) ; 3=Seldom buy milk (1 time/day per week or less than); and 4 = never consume milk

Results and discussion

Milk consumption behavior of the consumers

Frequency of milk consumption

Almost of respondents (86%) bought and consumed milk. There was still 14% of respondents answered never bought and consumed milk. The habit of using milk at the level of frequency "Ussually" and "Often" accounted for the most. The other level seemed to be equal at 14 to 16%.

Table 2: The frequency of milk consumption

Frequency	Numbers of respondents	Proportion (%)
Ussually	16	16
Often	28	28
Sometimes	28	28
Seldom	14	14
Never	14	14
Total	100	100

Source: Survey data, 2015

Age and milk consumption behavior

Age is considered to be one of the factors that influence milk consumption behavior in Vietnam. In the past, Vietnamese did not have the habit of consuming milk, therefore, it is assumed thatthe younger the respondents, the more habit and more chance to consume milk.

Age groups from 18 to 25 years old and 26 to 35 years old seemed to consume more frequently (75% of respondents consumed milk at "sometimes" to "usually" level) than that of the older group of 36 to 50 years old. In general, there were still 14% total respondents had not been consumed milk. The deep interview showed that, the main reasons led to this situation were: low income to buy milk and did not have a habit of using milk.

Table 3: Frequency of milk consumedby the age of the respondents

Age	Number/ratio	Frequency					Total
		Ussually	**Often**	**Sometimes**	**Seldom**	**Never**	
18-25	Number	4	6	8	2	4	24
	% of age group	16.7	25	33.3	8.3	16.7	100
	% of total	4	6	8	2	4	24
26-35	Number	6	16	8	6	4	40
	% of age group	15	40	20	15	10	100
	% of total	6	16	8	6	4	40
36-50	Number	6	6	12	6	6	36
	% of age group	16.7	16.7	33.3	16.7	16.7	100
	% of total	6	6	12	6	6	36
Total	Number	16	28	28	14	14	100
	% of age group	16	28	28	14	14	100
	% of total	16	28	28	14	14	100

Source: Survey data, 2015

Milk consumption habit of family members in the study was also investigated in order to learn more about the relationship between milk consume with the age level.
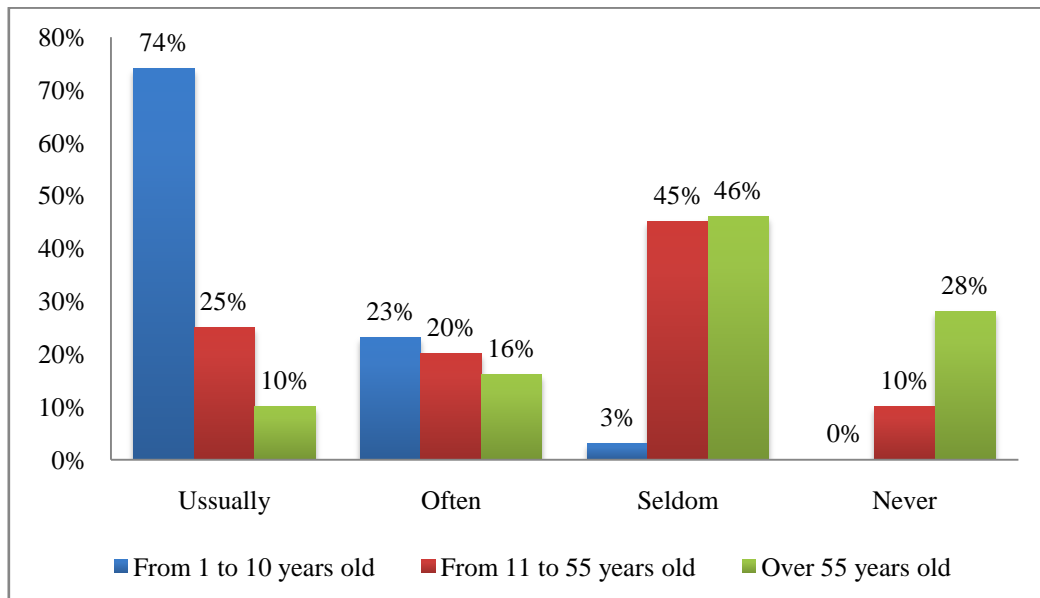

Figure 5: Frequency of milk consumed by age

Source: Survey data, 2015

This figure showed a trend that the older the Vietnamese, the less milk consumes frequently and it seemed right to the real situation of milk consumption behavior in Vietnam. For children aged from 1 to 10 years old, 100% consumed milk. In which, 74% of them almost consumed milk daily. This number implied that children always got the attention and priority in milk consumed. Teens, young adults and middle-aged, from 11- 55, seemed rarely to consume milk. The older age group from more than 55 years old, almost seldom, and never used milk (74%), only some good living condition families, or the elder with required medical treatment consumed milk, whileat these ages, milk is necessary to supplement calcium and other nutrients to help them more strong bones, prevent aging, and the prevention of other diseases.

Occupation and milk consumption behavior
Occupation is considered to affect milk consumption behavior in Vietnam as it is assumed that a good career could bring higher income which is a good condition for consuming milk[1], higher awareness of food and nutrition.

Table 4: Frequency of milk consumed by the occupation

Occupation	Number/ratio	Frequency Ussually	Often	Sometimes	Seldom	Never	Total
Government staff	Number	8	10	4	2	0	24
	% of the occupational group	33.3	41.7	16.7	8.3	0	100
	% of total	8	10	4	2	0	24
Trader/ retailer	Number	0	2	2	4	2	10
	% of the occupational group	0	20	20	40	20	100
	% of total	0	2	2	4	2	10
Worker/ farmers	Number	2	2	10	6	6	26
	% of the occupational group	7.7	7.7	38.5	23.1	23.1	100
	% of total	2	2	10	6	6	26
Unstable job	Number	4	4	2	0	0	10
	% of the occupational group	40	40	20	0	0	100
	% of total	4	4	2	0	0	10
Free job	Number	0	4	6	0	4	14
	% of the occupational group	0	28.6	42.9	0	28.6	100
	% of total	0	4	6	0	4	14
Housewife	Number	0	2	2	2	0	6
	% of the occupational group	0	33.3	33.3	33.3	0	100
	% of total	0	2	2	2	0	6
Others	Number	2	4	2	0	2	10
	% of the occupational group	20	40	20	0	20	100
	% of total	2	4	2	0	2	10
Total	Number	16	28	28	14	14	100
	% of the occupational group	16	28	28	14	14	100
	% of total	16	28	28	14	14	100

Source: Survey data, 2015

Survey results showed it seemed there was no clear pattern of milk consumption behavior by the occupation. All government staffs and unstable job respondents consumed milk, in which, 75% to 80% of them often consumed milk. Meanwhile, 60% trader/retailer and 46.2% worker/farmers seldom or never consumed milk.

Education and milk consumption behavior

There was a quite clear pattern of milk consumption behavior by the educational level of the respondents. It seems that the higher educational level consumed milk more frequently than those of the lower ones. All the postgraduates and graduates consumed milk, but the frequency of postgraduates was higher than that of the graduates. Meanwhile, there were 33.3%, 35.7% and 100% of respondents at the educational level of college/vocational training, high school and other seldom or never consumed milk, respectively.Deep interview showed that, the reasons for this situation were: the higher educational level respondents normally had a higher awareness about the role ofmilk in health care; and higher educational level respondents normally had a better job with a higher income to buy and consume milk.

Incomes and milk consumption behavior

Similar to the educational level, there was a quite obvious relationship between the frequencies of milk consumption by the average monthly income of the respondents' household. Most of the respondents with the household monthly income of less than 5 million VND seemed did not consume milk, while 66.6% and 54.2% of the respondents with income level from 20 million and over, and 10 to 20 million VND, respectively often consumed milk. This can be explained by the fact that, the higher income created higher purchasing power, higher affordability, which in turn, increase the chance to buy and consume milk for the household.

Table 5: Frequency of milk consumed by the educational level of the respondents

Education level	Number/ratio	Frequency Ussually	Often	Sometimes	Seldom	Never	Total
Postgraduates	Number	8	4	0	0	0	12
	Trình độ(%)	66.7	33.3	0	0	0	100
	Total (%)	8	4	0	0	0	12
Graduates	Number	6	12	8	6	0	32
	% of this educational level	18.8	37.5	25	18.8	0	100
	Total (%)	6	12	8	6	0	32
College/ vocational training	Number	0	4	12	2	6	24
	% of this educational level	0	16.7	50	8.3	25	100
	% of total	0	4	12	2	6	24
High school	Number	2	8	8	4	6	28
	% of this educational level	7.1	28.6	28.6	14.3	21.4	100
	% of total	2	8	8	4	6	28
Others	Number	0	0	0	2	2	4
	% of this educational level	0	0	0	50	50	100
	% of total	0	0	0	2	2	4
Total	Number	16	28	28	14	14	100
	% of this educational level	16	28	28	14	14	100
	% of total	16	28	28	14	14	100

Source: Survey data, 2015

Table 6: Frequency of milk consumed by the average monthly income of the respondents' household

Income	Number/ratio	Frequency Ussually	Often	Sometimes	Seldom	Never	Total
Less than 5 million VND	Number	0	0	0	2	2	4
	% of income level	0	0	0	50	50	100
	% of total	0	0	0	2	2	4
From 5 to less than 10 million	Number	2	4	14	4	6	30
	% of income level	6.67	13.33	46.67	13.33	20.00	100
	% of total	2	4	14	4	6	30
From 10 to less than 20 million	Number	6	20	10	8	4	48
	% of income level	12.50	41.67	20.83	16.67	8.33	100
	% of total	6	20	10	8	4	48
From 20 and over	Number	8	4	4	0	2	18
	% of income level	44.44	22.22	22.22	0.00	11.11	100
	% of total	8	4	4	0	2	18
Total	Number	16	28	28	14	14	100
	% of income level	16	28	28	14	14	100
	% of total	16	28	28	14	14	100

Source: Survey data, 2015

Factors affecting milk consumption behavior

In the selection equation of the model, three variables were found to be significant determinants of the households' behavior of milk consumption. These were education level (EDU) and career (JOB) of the respondents (also decision makers in milk consumption), and monthly income of households (INCOME).

All three variables: monthly income of the households, Education level (EDU), and career (JOB) of the milk consumption decision maker had positive effects on behavior of milk consumption of the householdsand found to be significant at less than 5% probability level. The positive relation between the variables indicates that any

additional monthly income, increase in educational level or improve/change of career (to the next level) enables the household to decide to purchase more milk.

Table 7: Affecting factors to milk consumption behavior

Variables	Coefficient	St.error	t-ratio
Constant	1.142	0.36	3.13*
AGE	-0.173	0.183	-0.945[NS]
EDU	1.299	0.196	6.62*
JOB	0.292	0.112	2.44**
INCOME	0.583	0.27	2.14**

F=11.54, number of observations (N) = 100, Multiple R=0.71159; R-squared=0.55636, Adjusred R-square=0.50081, significance level=0.0000,*and ** represents a significance level at 1%, and 5% probability level, respectively.

Conclusion

The study results showed that three of the four studied factors: the average monthly income of the household, education and career of the respondents (also decision makers in milk consumption of the household) had positive and significant influence to consumer behavior of milk consumption. Consumers had more professional careers such as government officers, traders consumed more frequently than those with less professional career such as workers, farmers, housewives. Consumers had higher education levels and higher incomes also consumed milk more often. Although consumer of the age group from 26 to 35 years old consumed milk more and more often compared to the other age groups, this impacts without statistical significance.

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