International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at:
Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

Consumption pattern of most popular milk and milk products purchased and consumed in and around National Capital Region of Delhi (NCR)

Dr Renuka Malik*

*Associate Professor, Home Science, GC Bahadurgarh, Haryana, India.

Abstract:
Being healthy is a basic human need. Milk and milk products are indispensable item of consumption for human beings and are an essential part of family diet. Health of the family members to a large extent depends upon the quality of milk and milk products consumed by them. In order to understand their consumption patterns, it is important to gather information on personal characteristics of the respondents, their motivation, perceptions and preferences in purchasing milk and milk products. Findings of the study as obtained after the analysis of data collected by the questionnaire-cum-interview schedule are analysed and described in this paper. **Keywords:** consumer pattern, milk and milk products, consumer behaviour

Introduction:

At global level, milk has been identified as an integral part of food for centuries. It is one of the most important food products with livestock origin and is extremely nutritious. It is an aqueous colloidal suspension of proteins, fats and carbohydrates that contains numerous vitamins and minerals and serves as a source of energy; hence, it is very essential for our life. Good quality milk is considered as a complete food in all segments of the population and in all stages of life (Haug et al., 2007). It contains fat which furnishes all the essential fatty acids. Milk proteins are complete as it contains all the essential amino acids required by the body and mend the wear and tear of the body. Milk is also a good source of different minerals, particularly, bone and teeth forming calcium and phosphorus. In addition, milk has certain unique qualities like it is a strong antioxidant, (Giovanna et al. 2009; Havemose, 2006), has survival advantage in vascular diseases (Elwood. Et al. 2010, 2008; Mackay et al. 2004) and has anti-cancerous effects. Considering its properties, milk is an important food for pregnant woman, growing children, adolescent, adults and patients alike.

In the coming years, consumption of milk and milk products in India is likely to grow significantly, driven by increase in number of consumers, higher income and greater interest in nutrition. Moreover, consumption of processed and packaged dairy products is also increasing in urban areas. Earlier, only the cooperatives were involved in packaged milk business in dairy industry in India but sensing the demand of milk among the increasing population, more private players have entered into the milk and milk product business. With the rise in competition and increase in the number of

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at:
Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

milk brands prevailing in the field of dairy industry, there is a need to make an attempt to understand the attitude and buying behaviour of consumers. The price variation for milk is high; hence, demand for milk is very sensitive to price changes. In many parts of the country, people still prefer unpacked and unprocessed milk delivered by a local milkman because of its taste and the perception of freshness. Main objective of the paper is to determine the
awareness and consumption pattern of consumers regarding milk and milk products **Locale of the research, sample selection and Methodology:**

The present research was carried out only on those consumers who were consuming milk and milk products. The study was conducted in Delhi as it was easily approachable and secondly, Delhi being the National capital of India has an added advantage as consumers from different parts of the country are residing here. For the purpose of sample selection for the present study, Delhi was trifurcated into three Municipal Corporations (as per Municipal Corporation of Delhi, MCD) for convenience in availability and collection of samples (Fig. 1).

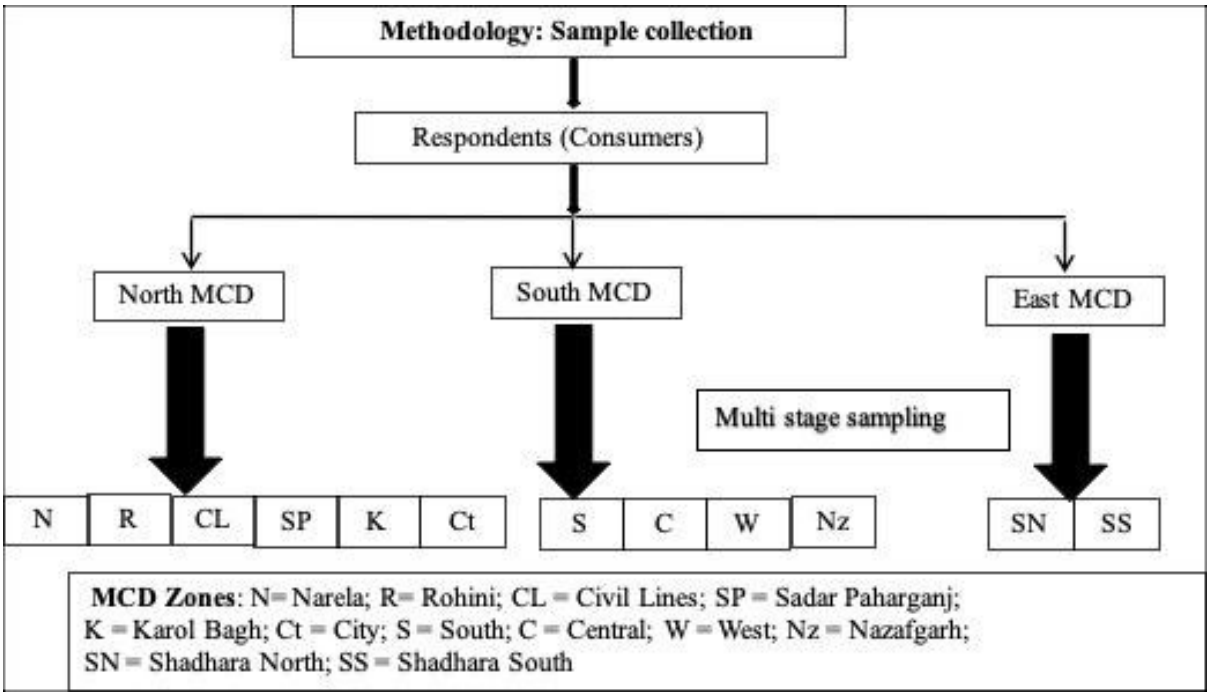

Fig: 1 Sample selected for the study were of two types.

Selection of Respondents consuming milk and milk products

Respondents consuming milk and milk products were selected randomly in order to explore consumer's awareness, besides studying their consumption pattern. The study was a community (consumer) based study where recruitment of participants and data collection took place in Delhi.

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at:
Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

Inclusion criteria

- Consumers: Residents of Delhi who gave consent to take part in the study.

Exclusion criteria

- Consumers: Non-Residents of Delhi and residents of Delhi who did not give consent to take part in the study.

Sample size estimation

The sample estimation formula was used for arriving at the number of consumers sampled to be interviewed for the Knowledge, Attitude and Practice (KAP) of consumers.

The formula used for estimating the number of consumers to be interviewed is described below:

$$n = \frac{t^2 \times P(1-P)}{m^2}$$

Where t = Confidence interval = 1.96

P = Estimated prevalence percentage (Probability). Since probability was not known we took it as 50% or 0.5

m = Margin of error = 0.05

Therefore, using this formula, the following is calculated

$$n = \frac{1.96 \times 1.96 \times 0.5(1-0.5)}{(0.05)^2} = 384$$

The sample size of 384 was derived from this formula but for convenience in statistical procedures and to enable proper statistical derivations, a total number of 390 consumers (130 from each zone) was considered for the research. **Result and discussion:**

Consumption pattern

As main objective of the present study is to find out the consumption pattern of consumers regarding milk and milk products, an attempt was made to study this aspect. Jagadish Badola (1989) and Gupta and Harpal Kaur (1995), in their study revealed that the per capita consumption of milk was significantly higher than the minimum recommended nutritional level as per Indian Council Medical Research (2000), excluding the rural non-farming class and low income service class. A study conducted by Datta et al. (2002) showed that among the food items, cereals constituted the single largest item of expenditure both in rural and urban areas followed by liquid milk. It was also reported from their study, that milk and milk products occupied prominent place and raised steadily with increase in income both in urban and rural areas. The demand for milk in rural area was more sensitive to change with income as compared to urban area. **Purchase practices for milk i) Time of milk purchase**

Around 35 percent respondents on the whole, were found purchasing milk both during morning as well as evening hours. This might be due to easy availability of packaged milk at any hour of the day that makes it possible for the respondents to purchase it as per their convenience. The results regarding purchasing hours were found to be highly significant.

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

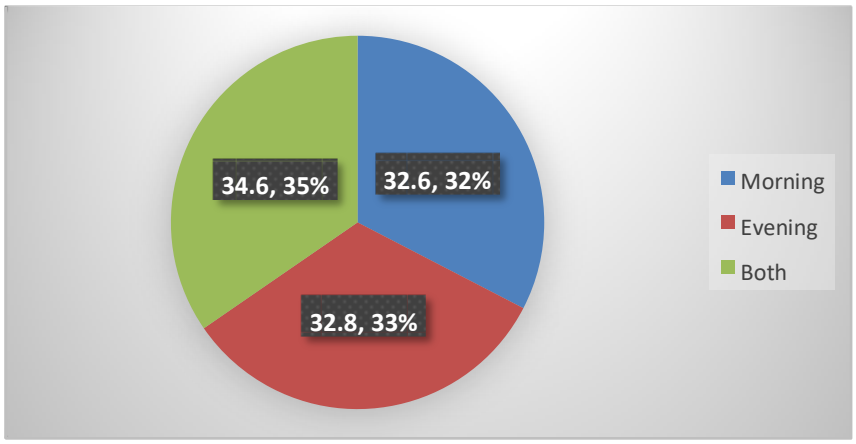

Fig 2: Milk purchase hours of respondents

Chi-square-25.202, p-value-.000 (*p-value is significant at 0.05) **ii)**

Source of supply of milk

In Delhi, milk is supplied to the consumers both in packaged and loose forms; at various outlets like at mother dairy, at shops, in the local markets as well as supplied by vendors and at the source of milking. Besides, at big shopping malls, various brands of tetra packaged milk as well as flavoured milk are also available.

Scrutinising all these sources, it was revealed that, consumption was the highest for packaged milk from an outlet in the local market. Surprisingly, loose mother dairy milk and tetra packaged milk were found to be least preferred. Also loose vendor milk was purchased by one fourth of the respondents from East Delhi, may be due to the existence of number of dairies in that area. These findings are indicative of the fact that respondents being educated, realised the importance of packaged branded milk. The results were also found to be statistically significant. Santhi (2005) had also complimented the similar results wherein, it was found that majority of the consumers bought branded milk due to reference group influence apart from personal preference whereas, unbranded milk was influenced by milk vendors.

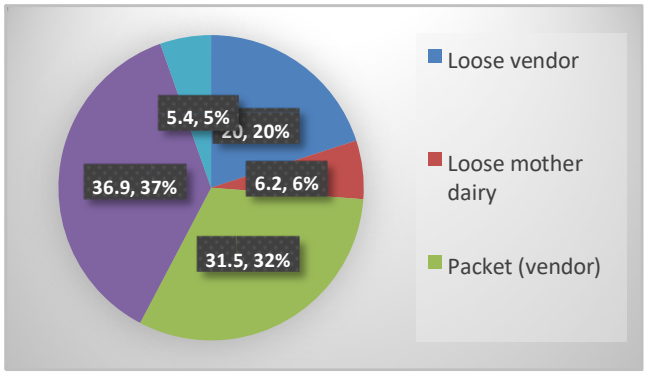

Fig 3: Respondent's source of supply of milk

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at:
Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

Chi-square-26.198, p-value-.003 (*p-value is significant at 0.05)

iii) Storage of milk at the outlet

The investigator was further keen to know the conditions under which the shopkeeper stored milk before selling it to the customers. It is an important aspect as far as the quality of milk is concerned. It was seen that 67.2 percent of the shopkeepers kept and stored the milk in the refrigerator, whereas, nearly one third (32.8 percent) of them kept it in the open crates without any refrigeration. Keeping the milk in open (crates) without refrigeration increases the chances of growth of microbes, thereby, resulting in early spoilage of milk. Consumers, in general are ignorant about this aspect. Because of this practice of storing the milk in open crates, without refrigeration, respondents did mention that at times milk gets sour and they reported preparing paneer out of it. But few threw the milk due to time shortage or they had no idea of preparation of paneer out of this spoilt milk.

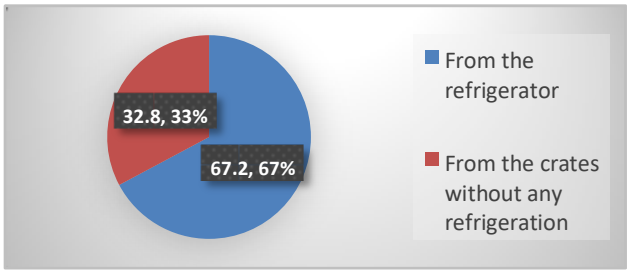

Fig 4: Storage of milk at the outlet

Chi-square-5.745, p-value-.057 (*p-value is significant at 0.05) **iv)**

Type of milk consumed by the respondents

Surprisingly in all the three zones, maximum consumption of milk by the respondents was found to be of full cream milk (53.7 percent) especially in East Delhi followed by toned milk (37 percent) especially in South Delhi. As far as double toned and skimmed milk were concerned, negligible number of consumers were found consuming these types of milk. This may be attributed to greater awareness of consumers in this area regarding the advantages of toned milk as they had higher education level.

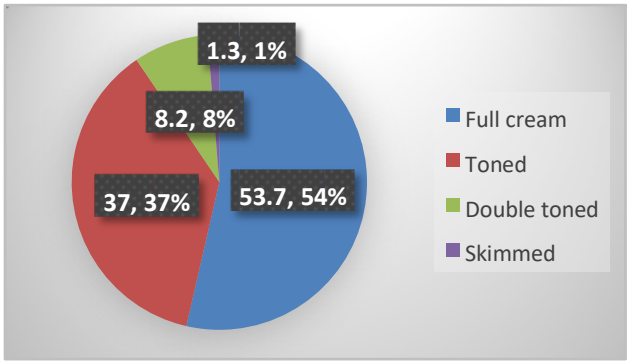

Fig 5: Type of milk consumed by the respondents

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

Chi-square-22.916, p-value-.062 (*p-value is significant at 0.05)

Table 1: Consumption behaviour for the purchase of milk

Consumption Behaviour	East (130) Freq (%)	North (130) Freq (%)	South (130) Freq (%)	Total (390) Freq (%)	Chi square	P-value
i) Purchasing hours						
Morning	**54(41.5)**	27(20.8)	46(35.4)	127(32.6)	**25.202**	**.000**
Evening	24(18.5)	**58(44.6)**	46(35.4)	128(32.8)		
Both	52(40)	45(34.6)	38(29.2)	**135(34.6)**		
ii) Source of supply of milk						
Loose vendor	36(27.7)	27(20.8)	15(11.5)	78(20)	**26.198**	**.003**
Loose mother dairy	12(9.2)	5(3.8)	7(5.4)	24(6.2)		
Packaged (vendor)	**40(30.8)**	41(31.5)	**42(32.3)**	123(31.5)		
Packaged (both the shop and mother dairy)	**40(30.8)**	**51(39.2)**	**53(40.8)**	**144(36.9)**		
Tetra packaged from shop/Mall	2(1.5)	6(4.6)	13(10)	21(5.4)		
iii) Storage of milk at the outlet						
In the refrigerator	**79(60.8)**	**97(74.6)**	**86(66.2)**	**262(67.2)**	5.745	.057
In the crates without any refrigeration	51(39.2)	33(25.4)	44(33.8)	128(32.8)		
iv) Type of milk						
Full cream	**77(59.2)**	**68(52.4)**	**64(49.2)**	**209(53.7)**	22.916	.062
Toned	37(28.5)	53(40.8)	54(41.5)	144(37)		
Double toned	15(11.5)	6(4.6)	11(8.5)	32(8.2)		

□ Skimmed	1(0.8)	3(2.3)	1(0.8)	5(1.3)		
Total	**130(100)**	**130(100)**	**130(100)**	**390(100)**		

Note: Figure in parentheses represent percentage (*p-value is significant at 0.05)

v) Mode of payment

Table 3highlighted that the majority of the consumers (85 percent) paid cash for purchase of milk; the maximum number of respondents being from North Delhi (92 percent). Only 8 percent of consumers opted for credit as the mode of payment. Results were found to be statistically significant.

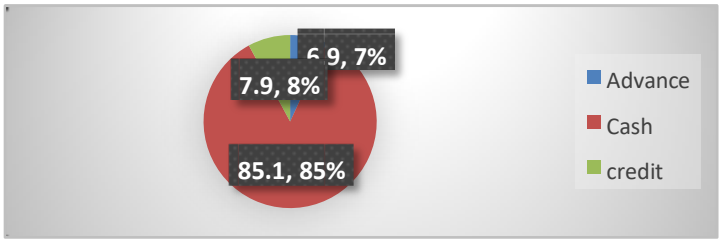

Fig 6: Mode of payment for milk purchase

Chi-square-15.234, p-value-.004 (*p-value is significant at 0.05) **vi)**

Frequency of purchase and daily Milk consumption

Milk as one of the categories of dairy products, belongs to the group of basic daily-consumed products characterized by relatively high purchase frequency as it is a perishable food item. Milk is preferred fresh and is consumed quickly. Eighty nine percent consumers purchased milk daily which varied between 501-2000 ml in nearly 60 percent families in almost all the three zones (Table 3). Only 11 percent of families purchased milk on alternate days or 2-3 days in a week (Table 3). Similar findings were indicated in the study by Ashok et al (2012) where most of the respondents showed their interest in purchasing milk on day-to-day basis.

It was found that number of children had significant effect on daily purchase of milk. Families having no child were purchasing less amount of milk daily as compared to families with children. The purchase of milk was twice or thrice in a week among families with no children. The results of influence of children on frequency of milk purchase was found to be highly significant (p value .042).

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

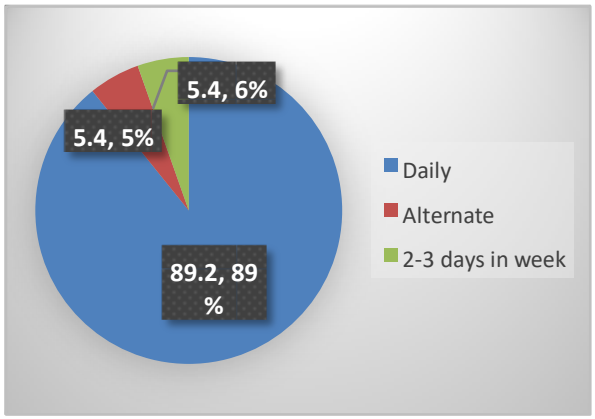

Fig 7: Frequency of milk purchase
Chi-square-21.906, p-value-.001 is significant at 0.05)

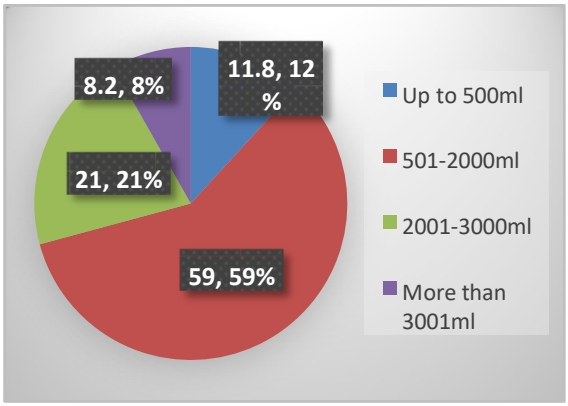

Fig 8: Daily milk consumption
Chi-square-2.727, p-value-.605 (*p-value

Data relating daily milk consumption and family size significantly revealed that as the family size increased, the milk consumption also increased. The consumption of milk was up to 2 litres in a family of up to four members whereas, in a family with more than 4 members, it was found to be above 2 litres. In a similar study by Hsu and Lin (2006), it was found that household size was a key factor in determining the milk consumption. Also, it was reported by the respondents that consumption of milk generally gets increased during festivals. Santosh Singh Bais et al (2008) also noted varied consumption pattern during summer vacations and festivals. The results were significant with regard to milk consumption (p value .000).

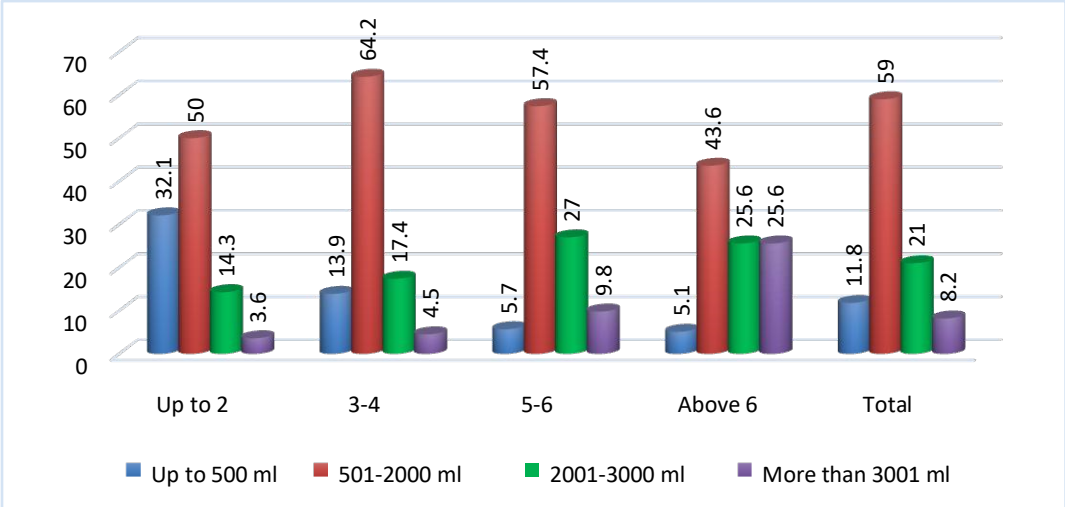

Fig. 10: Respondent's daily milk consumption (family size-wise)
Chi-square-42.129, p-value-.000 (*p-value is significant at 0.05)

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

Table 2: Consumption behaviour for the purchase of milk

Consumption Behaviour	East (130) Freq (%)	North (130) Freq (%)	South (130) Freq (%)	Total (390) Freq (%)	Chi square	P-value
v) Mode of payment						
Advance	17(13.1)	4(3.1)	6(4.6)	27(6.9)	**15.234**	**.004**
Cash	**99(76.2)**	**119(91.5)**	**114(87.7)**	**332(85.1)**		
credit	14(10.8)	7(5.4)	10(7.7)	31(7.9)		
vi) Frequency of Purchase						
Daily	119(91.5)	113(86.9)	116(89.2)	**348(89.2)**	2.727	.605
Alternate	4(3.1)	10(7.7)	7(5.4)	21(5.4)		
2-3 days in week	7(5.4)	7(5.4)	7(5.4)	21(5.4)		
vii) Amount consumed						
Up to 500ml	24(18.5)	18(13.8)	4(3.1)	46(11.8)	**21.906**	**.001**
501-2000ml	81(62.3)	69(53.1)	80(61.5)	**230(59)**		
2001-3000ml	18(13.8)	30(23.1)	34(26.2)	82(21)		
More than 3001ml	7(5.4)	13(10)	12(9.2)	32(8.2)		
Total	**130(100)**	**130(100)**	**130(100)**	**390(100)**		
viii) Method of storage of milk						
Boil and keep in Refrigerator after cooling	86(66.2)	87(67)	71(54.6)	**244(62.6)**	6.896	.331
Use without boiling	5(3.8)	7(5.4)	10(7.7)	22(5.6)		

Keep in refrigerator and boil before use	39(30)	36(27.7)	49(37.7)	124(31.8)		

Note: Figure in parentheses represent percentage (*p-value is significant at 0.05)

viii) Storage of milk

Just like all perishable food products, milk and milk products must be handled and stored properly to maintain their quality and safety. As evident from the Table3, 63 percent respondents preferred to boil milk before storing it in refrigerator while 32 percent of them boiled it just before use. In a tropical country like India, there are more chances of milk getting spoiled due to growth of microorganisms. Thus, consumers generally preferred boiling milk before use (even the pasteurized milk). Negligible number of consumers (5 percent) were found consuming milk even without boiling, may be due to their personal preference. On inquiring, these respondents commented that there was no need to boil milk as it was already pasteurized.

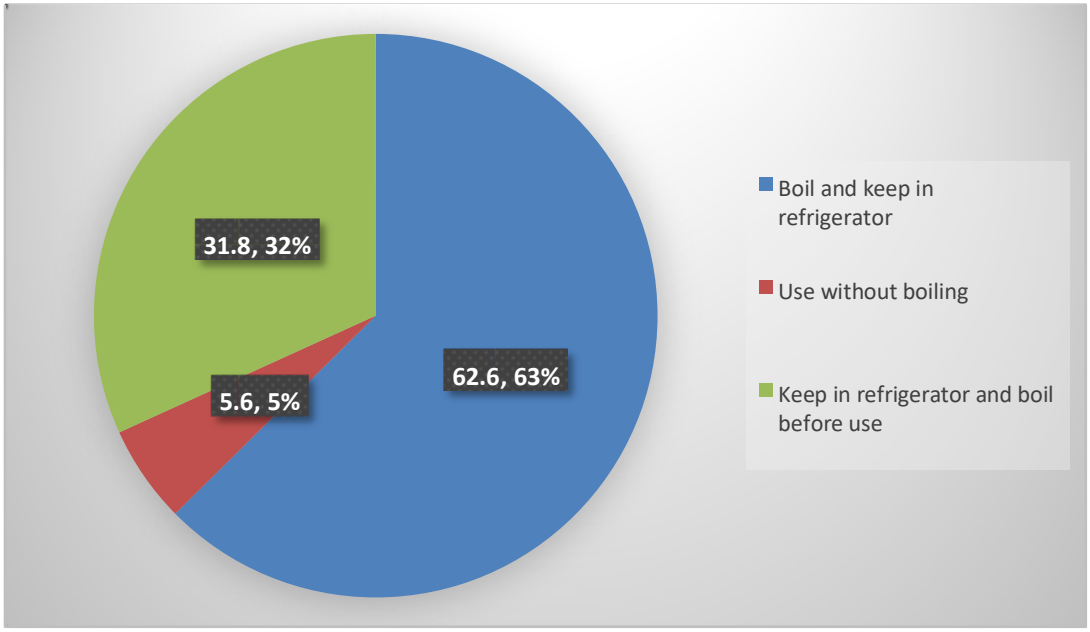

Fig 11: Respondent's method of storage of milk

Chi-square-6.896, p-value-.331 (*p-value is significant at 0.05)

Effect of women's employment on milk purchase hours

Most of the housewives preferred to buy milk in the morning hours (Table 3). Scrutiny of the data revealed that for the total sample as well as for zone-wise, maximum working ladies were from North Delhi who purchased milk during evening hours. Housewives, on the other hand were found

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

purchasing milk during morning hours and maximum of them were from East Delhi. This indicates that working women generally are busy during morning hours and hence, were found buying milk during evening hours which is more convenient for them. The results of women's employment on milk purchase hours were highly significant **Table 3: Impact of employment of women on milk purchase hours**

Women employment	Purchase hours				Chisquare	P value
	Morning	Evening	Both	Total		
	Freq(per)	Freq(per)	Freq(per)	Freq(per)		
Working	31(24.4)	**57(44.5)**	43(31.8)	131(33.5)	17.300	**0.002**
Housewife	**96(75.5)**	71(55.4)	92(68.1)	259(66.4)	13.883	**0.008**
Total	127(32.6)	128(32.8)	135(34.6)	390(100)	10.589	**0.019**

Note: Figure in parentheses represent percentage (*p-value is significant at 0.05)

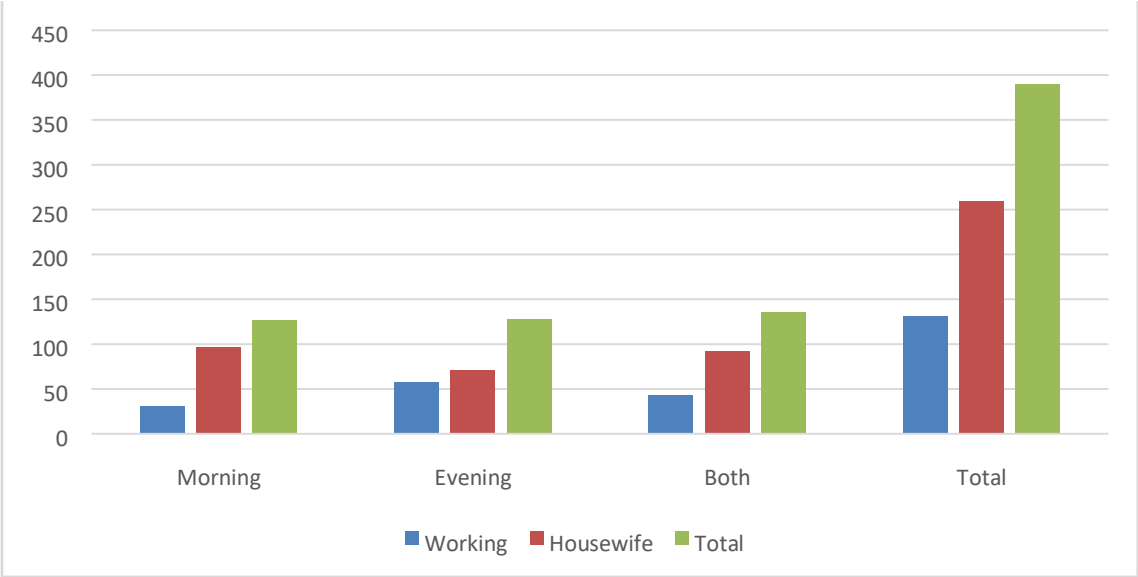

Fig 12: Impact of employment of women on milk purchase hours (zone-wise) Chi-square-10.589, p-value-.019 (*p-value is significant at 0.05)

Influence of education on the use of source of milk

Analysis of the results further indicated that consumption of tetra packaged milk was more among educated respondents. All the 21 respondents who bought tetra pack milk were either graduates or

International Journal of Research in Social Sciences
Vol. 8 Issue 9, September 2018,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A

post graduates. On the other hand, nearly 40 percent of the respondents having education up to high/secondary school were consuming loose milk from vendors, mother dairy or other retail outlets. This shows that probably being less educated they didn't realize the importance of packaged milk where chances of adulteration are less. Respondents having education up to or beyond graduation preferred to buy package/tetra packaged milk. CumaAkbay and Triyaki (2008) also found in their study that consumption of unpacked and packed milk and also the preferences for pasteurized and sterilized fluid milk were closely related with the education level of the decision maker of family. The results of source of milk on education were found to be highly significant.

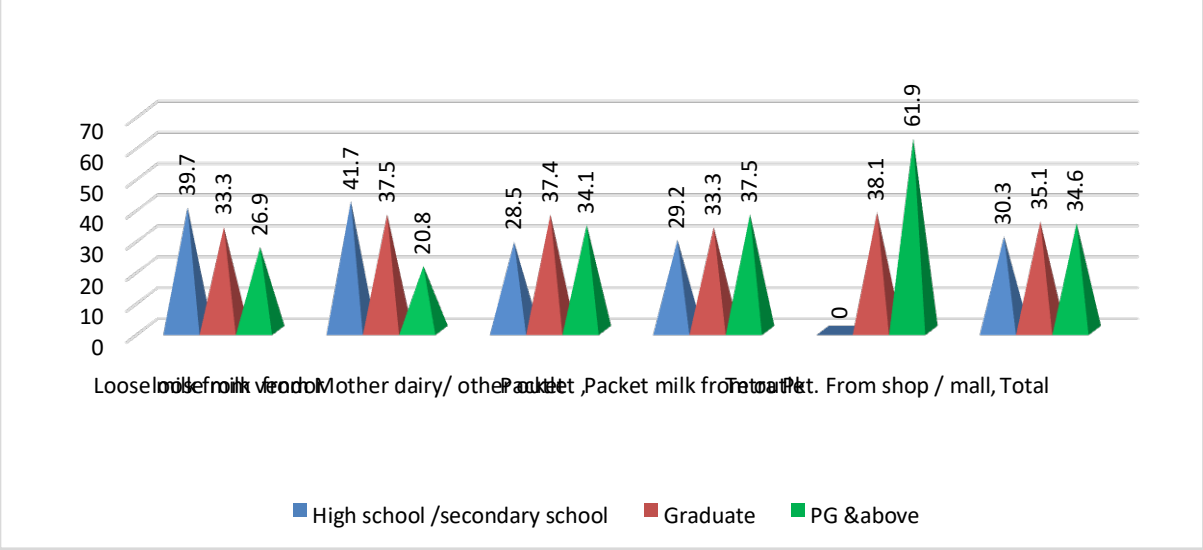

Fig 13: Respondent's use of source of supply of milk (education-wise) Chi-square-36.593, p-value-.013 (*p-value is significant at 0.05)

Conclusion

With regard to the consumption pattern of the respondents regarding milk and milk products, the following observations were made:

Amongst all the sources of milk, consumption was the highest for packaged milk from an outlet among all the three zones; nearly 74 percent of the respondents were purchasing packaged milk, indicating that respondents being educated, realized the importance of packaged branded milk. Loose vendor milk was purchased only by one fourth of the respondents from East Delhi due to existence of large number of dairies in that area. Most of the respondents from East zone (41.5 percent) preferred to buy milk in the morning whereas, in North zone, maximum number of respondents (44.6 percent) bought milk in the evening hours. This might be due to easy availability

of packaged milk at the outlets in Delhi at any hour of the day that makes it possible for the respondents to purchase as per their convenience.The average household daily milk consumption varied between 501-2000 ml in nearly 60 percent families in almost all the three zones, with average consumption of up to 2 litres for small family. The consumption increased in large families and also on special days especially during festivals.

REFERENCES

1. Ashok D. and Abhay PrakeshSriwastawa (2012). Product innovation and its influence on consumer purchasing pattern - a study on package dairy products in Bettiah (West Champaran, Bihar). *IOSR Journal of Business and Management*, 1(1), 22-28.
2. CumaAkbay and Gulgun (Yildiz) Tiryaki(2008). Unpacked and packed fluid milk consumption patterns. *Agricultural Economics*, 38, 9-20.
3. Datta, T.N. and Ganguly, B.K. (2002).An Analysis of Consumer Expenditure Pattern. In Indian State with Special Reference to Milk and Milk Products. *Indian Dairyman,* 54, (9), 47-56.
4. Elwood-Peter, C., Janet E., Pickering, D., Ian Givens, John and Gallacher, E. (2010). The consumption of milk and dairy foods and the incidence of vascular disease and diabetes: an overview of the evidence. *Lipids*, 45, 925–939.
5. Gupta and Harpal Kaur (1995). Consumption pattern of milk and milk products in Union Territory of Chandigarh. *Indian Dairyman*, 47(6), 34-37.
6. Haug, A., Høstmark, A.T. and Harstad, O.M. (2007). *Bovine milk in human nutrition – a review. Lipids in Health and Disease,* 6, 25. Available: http://www.lipidworld.com/content/6/1/25 [Accessed on January 25, 2015].
7. Havemose, M.S., Weisbjerg, M.R., Bredie, W.L.P. *and* Neilsen, J.H.(2006). Oxidative stability of milk influenced by fatty acids, antioxidants, and copper derived from feed. *Journal of Dairy Sciences,* 89(6), 1970-1980.

8. Hsu, J. and Lin, Y. (2006). Consumption and Attribute Perception of Fluid Milk in Taiwan. *Nutrition Food Science*, 36(3), 177-182.
9. ICMR (2000) Application of hazard analysis and critical control point for improvement of quality of processed foods. Indian Council Med Res Bulletin 30 p 5.
10. Jagadish BadolaMadan Mohan, C. (1989). *Dairy management in India*. Delhi, Mittle Publication, 9-33.
11. Santhi, P. (2005).Buyer-Behavior of Urban Households in Fluid Milk Markets with Reference to Coimbatore District*, Ph.D. Report, Bharathiar University, Coimbatore*.
12. Santosh Singh Bais and Ramesh, B.Agadi. (2008). Marketing of Branded Dairy Milk Products in Gulbarga District in Karnataka. *Journal of Contemporary Research in Management, July-Sep*, 1-27.