Study on Consumer Buying Behavior, Awareness and Preference for A2 Milk in Hyderabad, India

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Authors' contributions

This work was carried out in collaboration among all the authors. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Now-a-days almost all trending milk start-ups were following the principles and practices of age-old people. Indians were known to consume the desi milk since ages which is categorized as A2 milk. The concept of A2 milk has again trended when people started realizing the benefits of A2 milk, so market for A2 milk is also increasing rapidly. Around 10 A2 milk firms have emerged over the last 5 years in Hyderabad city, Hence, the study taken up to study consumer buying behaviour, awareness and preference of A2 milk in Hyderabad, Telangana state from January-March 2020. The 120 consumers were selected randomly from segmented areas of selected firms in the study area. Percentages, Chi-square test and factor analysis methods were used to analyse the data. The study revealed that majority of the consumers are well educated, middle aged people having more than 8lakhs annual income. Majority of the consumers were aware about A2 milk consumption increases brain function and A2 milk is a good measure for Type-I diabetes majorly through word-of-mouth and social media. Product quality, product attributes, health benefits, easy accessibility and word of mouth are the five factors which influencing the consumers to purchase A2 milk. Majority of the

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consumers were purchasing 3-7 litres/week of A2 milk on alternate day and depended upon home delivery for their regular purchase of A2 milk. Family size and annual income of the family had a significant association in determining the quantity of purchase of A2 milk.

1. INTRODUCTION

Milk consists of about 86 per cent water, 4.6 per cent lactose sugar, 3.7 per cent triglycerides, 2.8 per cent milk protein, 0.54 per cent minerals and 3.36 per cent other constituents. Casein is the chief component of the milk proteins of which about 30-35 percent is beta-casein. Beta – casein is of different types based on genetic background of animals, but the major types are A1 and A2 [1]. The A1 and A2 variants of beta casein differ at amino acid position 67 with histidine in A1 and proline in A2 milk as a result of single nucleotide difference [2]. Cows producing A1 milk are exotic cows (Taurine type) like Holstein, Friesian and Ayrshire whereas indigenous cows (Zebu type) like Gir, Red Sindhi and Sahiwal produce A2 milk [3]. Population consuming A2 milk are not prone to various diseases such as coronary heart diseases, Type -1 diabetes, sudden infant death syndrome and autism and had many health benefits such as better stool consistency and less incidence of bloating etc., [4] because it does not contain beta casomorphin-7 (BCM7), which is present in A1 milk due to its histidine position.

As people are becoming health conscious, the concept of A2 milk has again trended when people started realizing the benefits of A2 milk, so market for A2 milk is also increasing rapidly. In the recent past, several dairy units (local units and some organized players) in India have started offering A2 milk at premium price to consumers [5]. Around 10 A2 milk firms have emerged over the last 5 years in Hyderabad city. The present study was undertaken due to the research gap identified i.e., no study was available on buying behavior, awareness and preference for A2 milk in selected area and also the market for A2 milk is emerging in Hyderabad city. on this background, present study was taken up with the following objectives:

(i) to study the consumer buying behavior towards A2 milk and (ii) to analyse the consumer awareness and preference for A2 milk. It is carried out with the hypothesis that there is a significant association between quantity of purchase and socio-economic profile variables such as age, education, occupation, family size, annual income of the family.

2. MATERIALS AND METHODS

The survey was conducted in Hyderabad city. The data was collected from both primary and secondary sources. The study is mainly based on primary data. From the existing A2 milk selling firms in Hyderabad, two firms selected for conducting the study. Among the customers consuming the A2 milk supplied by the selected two firms, 120 consumers selected randomly from segmented areas of the selected firms. Primary data was collected from the consumers regarding socio-economic characters, awareness about the product, purchase behavior and preference towards A2 milk. Primary data collected by using well designed schedule. Relevant secondary data will be collected from websites, journals, magazines and reports of dairy boards and other government sources. The study was conducted in the month of January-March 2020. Mainly the collected data was tabulated and analysed by using various appropriate statistical tools such as percentages, Chi-square test [6,7] and factor analysis.

Chi-square test was examined by following statistic:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$ With (r-1) (c-1) degrees of freedom

Where, O_i = Observed number of cases in the ith category; E_i = Expected number of cases in the ith category; r = number of rows; c = Number of columns

Chosen significance (α) = .05

2.1 Factor Analysis

Factors (Viz., quality, no adulterants and freshness, taste, reasonable price, attractive packaging, health benefits, nutritive value availability, liked by family, trendy/fashionable and Suggested by friends/relatives) influencing the preference of A2 milk was analysed by factor analysis. Factor analysis was done by using PCA

analysis and rotated component matrix with KMO adequacy. Factor analysis and Principle Component Analysis (PCA) essentially are data reduction techniques. Factor analysis and PCA are techniques used when the researcher is interested in identifying the smaller number of factors underlying large number of observed variables. Variables that have a high correlation between them and are largely independent of other subsets of variables are combined into factors [8,9].

3. RESULTS AND DISCUSSION

3.1 Consumer Buying Behavior towards A2 Milk

It is observed from Table 1 that, the majority of the consumers are of age group of 30-36 years with 36.67 percent followed by age group of more than 42 years with 25.83 per cent, 36-42 years with 23.33 per cent, 24-30 years with 12.5 per cent and 18-24 years with 1.67 per cent. The calculated Pearson Chi-square test significance is .513 which is greater than the significance value (α=0.05) means accept the null hypothesis. Hence, there is no significant association between age and quantity of purchase among the respondents.

It is seen that, majority of the consumers (48.33 per cent) have completed post-graduation, 46.67 per cent studied up to graduation, and 5 per cent have completed intermediate. Thus, it is noticed that majority of the consumers are post graduates and graduates and none of the sampled consumers have occupied the category of illiterate and SSC. Chi-square test analysis indicated that, there is no significant association between education and quantity of purchase (Table 2).

According to Table 3, among sampled consumers, 30.83 per cent were private employees, 25 per cent were professionals includes doctors, lawyers, actors, professors etc., 21.67 per cent were government employees, 12.5 per cent were having their own business, 5 per cent were home makers and 6 per cent were others includes students, unemployed youth etc. Chi-square test analysis indicated that, there is no significant association between occupation and quantity of purchase.

It is seen that consumers having less than 3 members in family are of 20.83 per cent, 50 per cent are having three to four members in family, 26.67 per cent consumers having five to six members in family and only 2.5 per cent respondent's family size is more than seven. Chi-square test analysis indicated that, there is significant association between family size and quantity of purchase (Table 4).

Table 1. Age of the consumers and quantity of A2 milk purchased

Age group (years)	Quantity purchased (litres per week)				Total	p-value
	≤3	3-7	7-14	≥14		
18-24	0(0.00)	2(1.67)	0(0.00)	0(0.00)	2(1.67)	.51
24-30	5(4.17)	8(6.67)	1(0.83)	1(0.83)	15(12.5)	
30-36	5(4.17)	25(20.84)	13(10.83)	1(0.83)	44(36.67)	
36-42	4(3.33)	15(12.5)	9(7.5)	0(0.00)	28(23.33)	
>42	4(3.33)	15(12.5)	10(8.33)	2(1.67)	31(25.83)	
Total	18(15.00)	65(54.17)	33(27.5)	4(3.33)	120(100)	

Note: Figures in parenthesis indicate percentage to the total number of consumers

Table 2. Education level of the consumers and quantity of A2 milk purchased

Education level	Quantity purchased (litres per week)				Total	p-value
	≤3	3-7	7-14	≥14		
Illiterate	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	.70
SSC	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	
Intermediate	2(1.67)	4(3.33)	0(0.00)	0(0.00)	6(5.00)	
Graduation	7(5.83)	30(25.00)	17(14.17)	2(1.67)	56(46.67)	
Post-graduation	9(7.5)	31(25.84)	16(13.33)	2(1.67)	58(48.33)	
Total	18(15.00)	65(54.17)	33(27.5)	4(3.33)	120(100)	

Note: Figures in parenthesis indicate percentage to the total number of consumers

Table 3. Occupation of the consumers and quantity of A2 milk purchased

Occupation	Quantity purchased (litres per week)				Total	p-value
	≤3	3-7	7-14	≥14		
Government employee	3(2.5)	15(12.5)	7(5.84)	1(0.83)	26(21.67)	.16
Private employee	6(5.00)	23(19.16)	8(6.67)	0(0.00)	37(30.83)	
Home maker	3(2.5)	2(1.67)	1(0.83)	0(0.00)	6(5.00)	
Business	1(0.83)	8(6.67)	4(3.33)	2(1.67)	15(12.5)	
Professionals	4(3.33)	12(10.00)	13(10.84)	1(0.83)	30(25.00)	
Others	1(0.83)	5(4.17)	0(0.00)	0(0.00)	6(5.00)	
Total	18(15.00)	65(54.17)	33(27.5)	4(3.33)	120(100)	

Note: Figures in parenthesis indicate percentage to the total number of consumers

Table 4. Family size of the consumers and quantity of A2 milk purchased

Family size	Quantity purchased (litres per week)				Total	p-value
	≤3	3-7	7-14	≥14		
Less than 3	12(10.00)	13(10.83)	0(0.00)	0(0.00)	25(20.83)	.000
3 to 4	5(4.17)	45(37.5)	10(8.33)	0(0.00)	60(50.00)	
5 to 6	1(0.83)	7(5.84)	22(18.33)	2(1.67)	32(26.67)	
7 and above	0(0.00)	0(0.00)	1(0.83)	2(1.67)	3(2.5)	
Total	18(15.00)	65(54.17)	33(27.5)	4(3.33)	120(100)	

Note: Figures in parenthesis indicate percentage to the total number of consumers

**Table 5. Annual income of the family and quantity of the A2 milk purchased**

Annual income of the family	Quantity purchased (litres per week)				Total	p-value
	≤3	3-7	7-14	≥14		
≤2 lakhs	3(2.5)	0(0.00)	0(0.00)	0(0.00)	3(2.5)	.000
3-5 lakhs	1(0.83)	8(6.67)	1(0.83)	2(1.67)	12(10.00)	
5-8 lakhs	7(5.83)	28(23.34)	9(7.5)	0(0.00)	44(36.67)	
≥8 lakhs	7(5.83)	29(24.16)	23(19.17)	2(1.67)	61(50.83)	
Total	18(15.00)	65(54.17)	33(27.5)	4(3.33)	120(100)	

Note: Figures in parenthesis indicate percentage to the total number of consumers

It is seen that out of total consumers, 36.67 per cent of the consumers were having income range between 5 to 8 lakhs and 50.83 per cent were having income more than 8 lakhs. Only 2.5 per cent consumers were having income levels of below 2 lakhs and 10 per cent people were having income range of 2 to 5 lakhs. Chi-square test analysis indicated that, there is significant association between annual income of the family and quantity of purchase (Table 5).

Table 6. Period from when consumers are consuming A2 milk

Period	Total	Percentage
<1 month	10	8.33
1-3 months	7	5.83
3-6 months	6	5
6-9 months	26	21.68
1 year	40	33.33
1-3 years	31	25.83
>3 years	0	0.00
Total	120	100
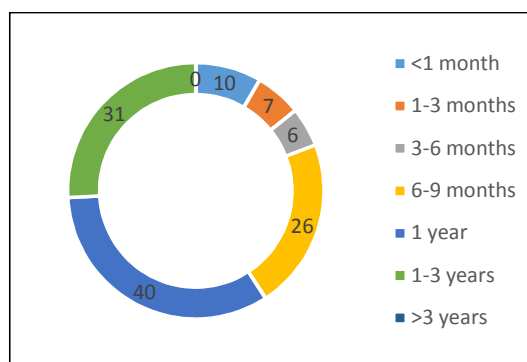
Fig. 1. Period from when consumers are consuming A2 milk

According to Table 6 and Fig. 1 that the majority of the consumers (33.33 per cent) have been consuming A2 milk from 1 year followed by 1-3 years (25.83), 6-9 months (21.68), 1<1 month (8.33 per cent), 1-3 months (5.83 per cent), 3-6 months (5 per cent) and none of the consumers were consuming A2 milk above 3 years.

Table 7. Consumers of A2 milk in the family of the selected consumers

S. No.	Major consumers	No. of consumers	Percentage to the total
1	Children	64	53.33
2	Youngsters	21	17.5
3	Middle age group	10	8.33
4	Senior citizens	25	20.84
5	Total	120	100

Table 8. Frequency of purchase of A2 milk by the consumers

S. No.	Frequency of purchase	No. of consumers	Percentage to the total
1	Daily	43	35.83
2	Alternate day	62	51.67
3	Twice a week	14	11.67
4	Weekly	1	0.83
5	Total	120	100

It was observed that, major consumers of A2 milk in the family of the selected consumers were children (53.33 per cent), youngsters (17.5 per cent), middle age group (8.33 per cent) and senior citizens (20.84 per cent). Thus, it can be observed that major consumers of A2 milk were children in the family. The results indicate that health consciousness of children in the family is increasing (Table 7).

According to Table 8 that the majority of the consumers (51.67 per cent) were purchasing A2 milk on alternate day followed by daily (35.83 per cent) and twice a week (11.67 per cent). Negligible per cent of the consumers were purchasing A2 milk weekly.

Table 9. Source of purchase of A2 milk in the study area

Purchase place	No. of consumers	Percentage to the total
Organic store	41	34.16
Supermarket	20	16.66
Home delivery	59	49.18
Total	120	100

It was found that, majority of the consumers (49.18 per cent) were purchased A2 milk through home delivery followed by organic store (34.16 per cent) and supermarket (16.66 per cent) (Table 9).

It was observed that, none of the consumers were purchasing milk for < Rs.100 per litre. Half of the consumers were purchased A2 milk at a price of Rs. 100-150 per litre and remaining half of the consumers were purchased A2 milk at a price of Rs. >150 per litre. (Table 10).

Table 10. Consumer purchase price of A2 milk in the study area

Price of milk (Rs./litre)	No. of consumers	Percentage to the total
<100	0	0.00
100-150	60	50.00
>150	60	50.00
Total	120	100

3.2 Consumer Awareness towards A2 Milk

According to Table 11, among all benefits, majority of the consumers (68.33 per cent) were known about A2 milk consumption increase brain function followed by measure for Type-I diabetes (66.67 per cent), decreases risk of heart diseases (63.33 per cent), immunity booster was known (48.33 per cent), anti-cancer properties (45 per cent), promotes easy digestion (42.5 per cent), decreases sudden infant death (32.5 per cent) and prevents Autism (22.5 per cent).

It is seen that, majority of the consumers (86.67 per cent) were aware about brand Klimom followed by Absolute milk (65.83 per cent), Krsna brand (53.33 per cent), SVS brand (40 per cent), Kiaro (37.5 per cent), Charaka (26.67 per cent), Moolrasa (20.00 per cent), Gowpala (16.67 per cent), Dhaara (12.5 per cent), Gavya natural (11.67 per cent), Govardhini (9.16 per cent) and others (9.16 per cent) includes 24 Mantra, Saro natural, etc., (Table 12).

According to Table 13 and Fig. 2, it is observed that, majority of the consumers (75 per cent) source of awareness about A2 milk from word-of-mouth, followed by Social media (66.67 per cent)

and newspaper (5.83 per cent). Negligible per cent of consumers mentioned that their source of awareness is TV.

3.3 Consumer Preference towards A2 Milk

3.3.1 Factors influencing preference for A2 milk

Factor analysis was used to know the consumer preference towards A2 milk. The first step is to check the adequacy of factor analysis with the help of Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity (Table 14). The KMO measure was 0.521 which reveals that the factors extracted will account for fair amount of variants. Although, it is possible to have as many factors as the number of variables. Those factors with Eigen values greater than one were considered for determining the number of factors. Therefore, with the help of Cattell's scree plot, factors were determined (Fig. 3).

Table 11. Consumers awareness about benefits of A2 milk

S.No.	Benefits of A2 milk	No. of consumers who are aware	Percentage to the total (n=120)
1	Reduces risk of Type-I diabetes	80	66.67
2	Reduces risk of Heart diseases	76	63.33
3	Immunity booster	58	48.33
4	Promotes easy digestion	51	42.5
5	Increase brain function	82	68.33
6	Decreases Sudden infant death	39	32.5
7	Anti-cancer properties	54	45
8	Prevents Autism	27	22.5

Note: Multiple responses were given by individual consumers

**Table 12. Consumer awareness towards different brands of A2 milk in the study area**

S.No.	Brands of A2 milk in the study area	No. of consumers who were aware	Percentage to the total (n=120)
1	Klimom	104	86.67
2	Krsna	64	53.33
3	Absolute milk	79	65.83
4	SVS	48	40
5	Dhaara	15	12.5
6	Moolrasa	24	20
7	Govardhini	11	9.16
8	Gowpala	20	16.67
9	Charaka	32	26.67
10	Gavya natural	14	11.67
11	Kiaro	45	37.5
11	Others	11	9.16

Note: Multiple responses given by individual respondent

Table 13. Sources of awareness of A2 milk

S.No.	Sources of awareness	No. of responses	Percentage to the total (n=120)
1	TV	02	1.67
2	Radio	00	0.00
3	Wall painting	00	0.00
4	Social media	80	66.67
5	Word of mouth	90	75.00
6	Newspaper	7	5.83
7	Display in retail stores	20	16.67

Note: Multiple responses were given by individual consumers.
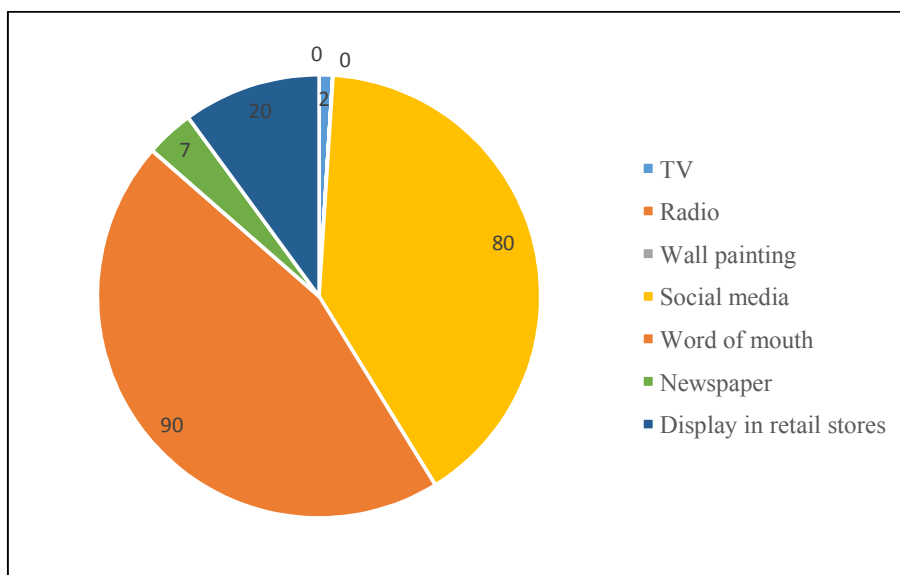
Fig. 2. Sources of awareness of A2 milk

The correlation matrix of rotated factor loadings is presented in Table 15. From the table, it could be observed that 5 factors were extracted from 12 statements. Factor 1 has three variables i.e. quality, no adulterants and freshness, hence labelled as "product quality". Factor 2 collects variables that relates to taste, reasonable price and attractive packaging. Hence, the second factor named as "product attributes". Factor 3 has two variables i.e. heath benefits and nutritive value and hence, it is labelled as "health benefits". Factor 4 collects variables that relates to availability and liked by family. Hence, factor 4 labelled as "easy accessibility". Factor 5 has two variables i.e. trendy/fashionable and Suggested by friends/relatives. These two factors indicate popularity of the product and hence, labelled as "WOM (word-of-mouth)".

Table 14. KMO and Bartlett's test for A2 milk consumers

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.521
Bartlett's Test of Sphericity	Approx. Chi-Square	124.435
	Df	66
	Sig.	.000

Table 15. Rotated component matrix of factors influencing preference for A2 milk

S.No.	Factors influencing preference for A2 milk	Component				
		Product quality	Product attributes	Health benefits	Easy accessibility	Word of mouth
1.	Quality	0.807	-0.204	-0.109	-0.112	0.023
2.	No adulterants	0.701	0.291	0.140	0.008	0.003
3.	Freshness	0.599	0.066	0.026	0.081	-0.354
4.	Taste	0.245	0.789	0.023	-0.106	0.000
5.	Reasonable price	-0.166	0.667	0.022	0.466	-0.081
6.	Attractive packaging	0.087	-0.518	0.409	0.186	0.090
7.	Health benefits	0.090	-0.052	-0.809	-0.014	0.039
8.	Nutritive value	0.116	-0.102	0.709	-0.188	0.055
9.	Availability	0.102	-0.014	-0.043	0.792	-0.219
10.	Liked by family	-0.138	-0.047	-0.104	0.693	0.305
11.	Trendy/ Fashionable	0.153	-0.093	-0.155	0.043	0.766
12.	Suggested by friends/relatives	-0.184	0.032	0.265	-0.012	0.678
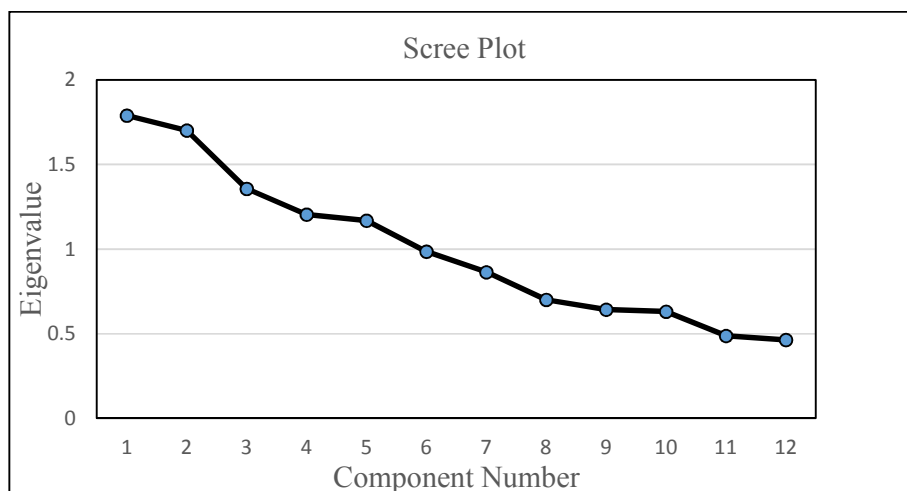
Fig. 3. Cattell's scree plot showing the factors influencing preference for A2 milk

4. CONCLUSION

The study revealed that majority of the consumers were well educated, middle aged people, private employees having more than Rs. 8lakhs annual income. Major consumers of A2 milk were children in the family. Majority of the consumers were consuming A2 milk since one year and mostly depended upon home delivery for their regular purchase of A2 milk. Majority of the consumers were purchasing 3-7 litres of A2 milk per week and mostly on alternate days. Majority of the consumers were aware that A2 milk consumption increases brain function and A2 milk is a good measure for Type-I diabetes, they were majorly aware about Klimom, Absolute milk and Krsna brands in the study area through word of mouth and social media. Product quality, product attributes, health benefits, easy accessibility and WOM are the five factors which influencing the consumers to purchase A2 milk. Family size and annual income of the family had a significant association in determining the quantity of purchase of A2 milk.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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