International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

Consumption Pattern of Jaggery and Jaggery Products in 3 Cities in Western Maharashtra

Sulakshana M. Mane[1], Shobha Udipi[2]

SNDT Womens University, Juhu, Mumbai, Maharashtra, India

Abstract: ***Jaggery is a traditional sweetener prepared from sugarcane. Jaggery as a sweetener has useful nutritive components and is said to have various health benefits. Despite having better nutrient composition that refined sugar, use of jaggery appears to have decreased. The present investigation studied consumption patterns of jaggery and jaggery products in 3 cities in Western state of Maharashtra, India. It was found that majority of the people use sugar on a daily basis as compared to jaggery which they mostly use during festivals or special occasions. Color was the major criteria followed by shape and texture while choosing jaggery. Families used jaggery in various products, puranpoli being the most popular. 80% families purchase of jaggery for around 50 Rs per month.***

Keywords: jaggery, jaggery products, iron deficiency

1. Introduction

Jaggery or *gur* is a traditional Indian sweetener used as an ingredient extensively in Indian cuisines in sweet and savory dishes across India. For example, a pinch of it is sometimes added to *sambar, rasam*, dal or vegetables and other staples to add sweetness and/or to balance the spicy, salty and sour components, particularly in Gujarati cuisine. Maharashtra is the largest producer and consumer of jaggery (16). People use *gur* for making different innovative recipes such as *gurdhania, mix chanagur barfi, gur cup cakes/ cakes, gur coconut barfi, multigrain roll, candies (4), besides traditional products such as puran poli , laddoos, chikki etc(6)*

In Indian market, jaggery is available in solid, liquid and powder forms. Eighty percent of jaggery is available in solid form, whereas remaining 20% is in liquid or granular form. Value - added jaggery viz. cubical jaggery, -rectangular jaggery, liquid, granular and jaggery is also available. The Indian Institute of Sugarcane Research, Lucknow has experimented extensively on developing value-added jaggery. It is an healthier option to enhance the nutritive value of food. Jaggery is more nutritious than sugar as a sweetener specially when it is used with dry fruits, peanuts, amla, ginger,etc. All food products prepared with refined sugar can be prepared with jaggery.

Organic jaggery contains sucrose and glucose but also has some amount of minerals and vitamins (7). Jaggery is considered as a pure and wholesome food, it shares the variety of minerals and vitamins of sugarcane juice. Being a good source of iron, it has the potential to prevent anemia and also contains essential nutrients like magnesium, potassium, selenium, manganese and zinc. It is said to be helpful in proper functioning of nervous system, regulation of blood pressure and heart function.(4). Besides providing energy, it is said to improve digestion and strengthen the lungs and bones (2). It is extensively used in various Ayurvedic medicines. To prepare these Asavas and Arishta, jaggery is used as a source of sucrose. Washed jaggery maintains the balance between vata and pitta, cleanses and detoxifies blood, improves digestive system, cleanses intestines and is good for heart (10).

In this context, in the present study examined the consumption pattern in three cities of Maharashtra, wherein frequency of jaggery consumption, type, preferences and the various recipes in which jaggery is used, were syudied.

2. Materials and Methods

Consumption pattern of jaggery and jaggery products in 3 cities of Maharashtra

Location of the study: Three cities were studied namely- Mumbai, Pune , Kolhapur. In Kolhapur and Pune, residents of the city proper and newer developing areas within city limits were included. In Mumbai 35 families were selected from Mumbai Western region and 65 families were selected from Eastern region.

Sample size and selection: Number of families per city: 100
A total of 300 families were studied. In all three areas housewives were recruited after obtaining informed consent. Recruitment was done by purposive sampling based on their use of jaggery.

Data Collection: An interview schedule was used to collect information on general information including location , eating habits, religion, amount and frequency of jaggery purchase, consumption, and use ,amount and frequency of consumption of processed jaggery products.Data was collected by interviewing the housewife in either English or Marathi.

3. Statistical Analysis

Data was entered in Microsoft Excel and was analysed using SPSS version 16. Pearson's chi-square analysis was done to determine whether selected factors such as city of residence, type of family and religion influenced purchase and use of jaggery.

4. Results

4.1 Profile of Sample

Majority of the families (n=257, 85.7%) were Hindu, 37 (12.3%) were Muslim, 3 (1%) were Christian and 3 families (1%) followed other religion. Approximately one-third (35.6%) families were joint families whereas 64.4% were nuclear families, 17.5% families were vegetarian, 80.5% families were non-vegetarian, 2% families were ovo-vegetarian.

Frequency of jaggery consumption by the 300 families was recorded. Only 17.3% families consumed jaggery on a daily basis. A little less than half (n=145,48.3%) families preferred using jaggery over sugar(Table 1).

Table 1 presents the preferred sweetener between jaggery and sugar when the families were classified according to city of residence, religion or type of family. 35% families from Kolhapur, 68.6% families from Mumbai Western, 63.1% families from Mumbai Eastern and 45% families from Pune preferred jaggery over sugar. A significant association of city of residence was observed with the preferred sweetener with higher percentage of families from Kolhapur and Pune preferring sugar as a sweetener as compared to jaggery ($p<0.05$) (Table 1). Between Hindus and Muslims, 45.9% Hindus and 59.5% Muslims preferred jaggery over sugar. A slightly lower percentage of nuclear (46.4%) preferred jaggery over sugar as compared to joint (52.8%) families. However, no significant association was observed between the preference of sweetener between jaggery and sugar with either religion or type of family indicating that religion or type of family did not affect the preference of sweetener ($p>0.05$) (**Table 1**).

Frequency of purchase of jaggery: Of the 300 families, 154 (51.3%) purchased jaggery occasionally or rarely, 118 (39.3%) consumed jaggery once/ month, 18 (6%) consumed jaggery once/ week, 5 (1.7%) consumed jaggery twice/ week, 3 (1.0%) consumed jaggery thrice a week and only 2 (0.7%) consumed jaggery daily (Figure 1).

Frequency of consumption: Of the 300 families, 52 (17.3%) families consumed jaggery on a daily basis whereas 248 (82.7%) families did not consume jaggery, 171 (57%) consumed jaggery occasionally or rarely, 26 (8.7%) consumed jaggery once/ month, 27 (9%) consumed jaggery once/ week, 22 (7.3%) consumed jaggery twice/ week, 20 (6.7%) consumed jaggery thrice/ week and 34 (11.3%) (Figure 1).

Table 2 gives frequency of purchase of jaggery when classified according to city, religion and type of family. A high percentage of families from Kolhapur (63%) and Pune (58%) purchased jaggery occasionally/ rarely. In Mumbai 68.6% families from Western region and 60% families from Eastern region purchased jaggery once in a month. A significant association of city of residence was observed with frequency of purchase of jaggery ($p<0.05$) (Table 2). A higher percentage of families from Mumbai purchased jaggery more frequently whereas higher percentage of families from Kolhapur and Pune purchased jaggery occasionally or rarely (Table 2).

A higher percentage of Muslim families (64.9%) purchased jaggery once in a month whereas 54.6% of the Hindu family purchased jaggery occasionally/ rarely (Table 2). A significant association of religion was observed with frequency of purchase of jaggery with a higher percentage of Hindus purchasing jaggery occasionally as compared to Muslims ($p<0.5$) (Table 2). A little more than half of the nuclear families surveyed (56.2%) purchased jaggery was occasionally/ rarely whereas joint families (47.2%) was once/ month, although there was no statistically significant association between frequency of purchasing jaggery and type of family ($p>0.05$) (Table 2).

Table 3 gives frequency of use of jaggery when examined according to city of residence, religion and type of family. As seen in Table 3, the higher frequency for use of jaggery was by families from Kolhapur (83%), western suburbs of Mumbai city (37.1%) and Pune (60%) whereas the usage by families from eastern suburbs of Mumbai (29.2%) was on daily basis. A significant association was observed between city of residence and the frequency of use of jaggery ($p<0.05$). Higher percentage of families from Mumbai used jaggery more frequently than families from Kolhapur and Pune who preferred to use jaggery occasionally or rarely (Table 3). A significant association of religion was observed with frequency of use of jaggery. A higher percentage of Hindus used jaggery occasionally as compared to Muslims ($p<0.5$). There was no significant association between frequency for using jaggery and type of family (Table 3).

4.2 Characteristics of jaggery considered while purchasing

Characteristics of jaggery that the families considered while purchasing jaggery were noted. 95.3% reported that they considered colour as an important characteristic, 16% reported that looked at the shape and about one-third (37.3%) reported that they looked at texture while buying jaggery.

Figure 2 gives characteristics of jaggery considered while purchasing when classified according to city of residence. As seen in Figure 2, a significant association of shape was observed with city of residence ($p<0.05$). A higher percentage of families from Mumbai considered shape of jaggery while purchasing jaggery as compared to Kolhapur and Pune A significant association with consideration of texture was observed with city of residence ($p<0.05$). Lower percentage of families from Pune considered texture while purchasing as compared to Kolhapur and Mumbai. However, there was no significant association between consideration of colour with city of residence with a similar percentage of families from all cities considering colour while purchasing jaggery ($p>0.05$) (Figure 2).

4.3 Use of Jaggery in Different Food Products:

A structured list of 29 food items was presented to each housewife who was asked whether she used jaggery in preparation the food items listed. Table 5 presents the

percentage of families using jaggery in preparation of different food products. Maximum (82.7%) families used jaggery in preparation of puranpoli , whereas a very small percentage (5.3%) families used jaggery in preparation of usal. More than 50% families used jaggery in preparations such as modak, chikki, groundnut ladoo. Another 25-50% families used jaggery in preparation of dal, kheer, kurmura ladoo, til ladoo, gud poli, gud papdi, dink ladoo and Gulamba i.e. raw mango murabba. Less than 25% families used jaggery in preparation of vegetables, usal, methi ladoo, sweet poha, sweet rice, gud puri, aamras, sheera, karanji, khaja, malpua, kayri panna, sweetpickle, chunda, sweet bhaji, and other foods (Table 4).

Table 5 gives percentage of families using jaggery in preparation of different food products

When examined according to city of residence, a significant association was observed with city of residence for the percentage of families using jaggery in preparation of vegetables, dal, kheer, modak, chikki, groundnut ladoo, kurmura ladoo, methi ladoo, til ladoo, puranpoli, sweet poha, sweet rice, gud poli, gud puri, aamras, sheera, gud papdi, malpua, kayri panna, dink ladoo, gud amba, chunda, sweet bhaji and other foods ($p<0.05$) (Table 5). Higher percentage of families from Mumbai (both Western and Eastern) used jaggery in preparation of vegetables, chikki, kurmura ladoo, methi ladoo, til ladoo, gud papdi and chunda as compared to families from Kolhapur and Pune. Higher percentage of families from Kolhapur and Mumbai Eastern used jaggery in preparation of dal as compared to families from Mumbai Western and Pune. Higher percentage of families from Kolhapur used jaggery for preparation of kheer, modak, sweet poha, gud poli, aamras, sheera, malpua, dink ladoo and sweet bhaji as compared to families from Mumbai (both Western and Eastern) and Pune . Higher percentage of families from Pune used jaggery in preparation of groundnut ladoo and other foods as compared to families from Kolhapur and Mumbai (both Western and Eastern). Higher percentage of families from Kolhapur and Pune used jaggery in preparation of puranpoli and gulamba as compared to families from Mumbai (both Western and Eastern). Lower percentage of families from Kolhapur used jaggery in preparation of kayri panna as compared to Mumbai (both Western and Eastern) and Pune. There was no significant association in percentage of families using jaggery in preparation of usual, karanji, khaja, sweet poha and gulamba when classified according to city of residence ($p>0.05$) (Table 5).

Table 6 gives percentage of families using jaggery in preparation of different food products when classified according to religion and according to type of family. A significant association of religion was observed with percentage of families using jaggery in preparation of vegetable, kheer, modak, chikki, churmura ladoo, methi ladoo, til ladoo, puranpoli, gud papdi, dink ladoo, gud amba, chunda and other foods. Higher percentage of Muslim families used jaggery in preparation of vegetables, chikki, churmura ladoo, methi ladoo til ladoo and chunda as compared to Hindu families. Higher percentage of Hindu families used jaggery in preparation kheer, modak, puranpoli, gud papdi, malpua, dink ladoo, gulamba and other foods as compared to Muslim families. No significant association was seen of between percentage of families using jaggery in preparation of dal, usal, groundnut ladoo, sweet poha, sweet rice, gud poli, gud puri, aamras, sheera, karanji, khaja, kayri panna, sweet pickle, sweet bhaji and gulamba and religion ($p>0.05$) A significant association of type of family was observed with use of jaggery in preparation of kheer, chikki, til ladoo sweet poha, sweet rice, gud poli, gud puri, aamras, karanji, gud papdi, dink ladoo, gud amba, sweet bhaji and gudamb ($p<0.05$). Higher percentage of joint families used jaggery in preparation of kheer, chikki, til lasoo, sweet poha, sweet rice, gud poli, gud puri, aamaras, gud papdi, dink ladoo, gul amba, sweet bhaji and gulamba as compared to nuclear families . Higher percentage of nuclear families used jaggery in preparation of karanji as compared to joint families. No significant association was seen in percentage of families using jaggery in preparation of vegetable, dal, usal, modak, groundnut ladoo, churmura ladoo, methi ladoo, puranpoli, sheera, khaja, malpua, kayri panna, sweet pickle, chunda and ther foods when classified according to type of family ($p>0.05$) (**Table 6)**

Table 1: Preferred sweetener between jaggery and sugar when classified according to City, religion and type of Family

Variable	Sugar	Jaggery	Chi square	P value
City				
Kolhapur (n=100)	65 (65)	35 (35)	18.962	0.001
Mumbai Western (n=35)	11 (31.4)	24 (68.6)		
Mumbai Eastern (n=65)	24 (36.9)	41 (63.1)		
Pune (n=100)	55 (55)	45 (45)		
Religion				
Hindu (n=257)	139 (54.1)	118 (45.9)	2.379	0.123
Muslim (n=37)	15 (40.5)	22 (59.5)		
Type of family				
Nuclear family (n=192)	103 (53.6)	89 (46.4)	1.147	0.284
Joint family (n=106)	50 (47.2)	56 (52.8)		

Data presented as frequency (percentage)

Table 2: Frequency of purchase of jaggery when classified according to City, religion and type of family

Variable	Occasionally/ rarely	Once/ month	Once/ week	Twice/ week	Thrice/ week	Daily	Chi square	P value
City								
Kolhapur (n=100)	63 (63)	20 (20)	12 (12)	3 (3)	2 (2)	0 (0)	51.188	0.001
Mumbai Western (n=35)	9 (25.7)	24 (68.6)	1 (2.9)	1 (2.9)	0 (0)	0 (0)		
Mumbai Eastern (n=65)	24 (36.9)	39 (60)	1 (1.5)	0 (0)	0 (0)	1 (1.5)		
Pune (n=100)	58 (58)	35 (35)	4 (4)	1 (1)	1 (1)	1 (1)		
Religion								
Hindu (n=257)	141 (54.9)	89 (34.6)	18 (7)	5 (1.9)	3 (1.2)	1 (0.4)	17.108	0.004

Muslim (n=37)	12 (32.4)	24 (64.9)	0 (0)	0 (0)	0 (0)	1 (2.7)		
Type of family								
Nuclear family (n=192)	108 (56.2)	67 (34.9)	10 (5.2)	4 (2.1)	1 (0.5)	2 (1)	8.670	0.123
Joint family (n=106)	45 (42.5)	50 (47.2)	8 (7.5)	1 (0.9)	2 (1.9)	0 (0)		

Table 3: Frequency of use of jaggery when classified by City, religion and type of family

Variable	Occasionally/ rarely	Once/ month	Once/ week	Twice/ week	Thrice/ week	Daily	Chi square	P value
City								
Kolhapur (n=100)	83 (83)	2 (2)	11 (11)	1 (1)	0 (0)	3 (3)	101.524	0.001
Mumbai Western (n=35)	13 (37.1)	2 (5.7)	5 (14.3)	2 (5.7)	6 (17.1)	7 (20)		
Mumbai Eastern (n=65)	13 (20.6)	12 (18.5)	4 (6.2)	6 (9.2)	9 (13.8)	19 (29.2)		
Pune (n=100)	60 (60)	10 (10)	7 (7)	13 (13)	5 (5)	5 (5)		
Religion								
Hindu (n=257)	159 (61.9)	20 (7.8)	22 (8.6)	20 (7.8)	17 (6.6)	19 (7.4)	30.191	0.001
Muslim (n=37)	11 (29.7)	4 (10.8)	5 (13.5)	2 (5.4)	2 (5.4)	13 (35.1)		
Type of family								
Nuclear family (n=192)	111 (57.8)	18 (9.4)	15 (7.8)	15 (7.8)	12 (6.2)	21 (10.9)	1.176	0.887
Joint family (n=106)	58 (54.7)	8 (7.5)	12 (11.3)	7 (6.6)	8 (7.5)	13 (12.3)		

Table 4: Percentage of families using jaggery in preparation of different food products:

Preparation	Yes	No
Vegetables	30 (10)	270 (90)
Dal	131 (43.7)	169 (56.3)
Usal	16 (5.3)	284 (94.7)
Kheer	78 (26)	222 (74)
Modak	154 (51.3)	146 (48.7)
Chikki	175 (58.3)	125 (41.7)
Groundnut ladoo	205 (68.3)	95 (31.7)
Churmura ladoo	85 (28.3)	215 (71.7)
Methi ladoo	50 (16.7)	250 (83.3)
Til ladoo	115 (38.3)	185 (61.7)
Puranpoli	248 (82.7)	52 (17.3)
Sweet poha	42 (14)	258 (86)
Sweet rice	55 (18.3)	245 (81.7)
Gud poli	96 (32)	204 (68)
Gud puri	70 (23.3)	23 (76.7)
Aamras	34 (11.3)	266 (88.7)
Sheera	53 (17.7)	247 (82.3)
Karanji	74 (14.7)	226 (75.3)
Gud papdi	102 (34)	198 (66)
Khaja	34 (11.3)	266 (88.7)
Malpua	42 (14)	258 (86)
Kayri panna	34 (11.3)	266 (88.7)
Dink ladoo	85 (28.3)	215 (71.7)
Sweet pickle	55 (18.3)	245 (81.7)
Gulamba	107 (35.7)	193 (64.3)
Chunda	26 (8.7)	274 (91.3)
Sweet bhaji	49 (16.3)	251 (83.7)
Gudamb	46 (15.3)	254 (84.7)
Other foods	73 (24.3)	227 (75.7)

Table 5: Percentage of families using jaggery in preparation of different food products when classified according to city of residence

Preparation/ variables	City/Region				Chi square	p value
	Kolhapur (n=100)	Mumbai Western (n=35)	Mumbai Eastern (n=65)	Pune (n=100)		
Vegetables	2 (2)	9 (25.7)	13 (20)	6 (6)	25.714	0.001
Dal	52 (52)	14 (40)	34 (52.3)	31 (31)	11.510	0.009
Usal	5 (5)	2 (5.7)	4 (6.2)	5 (5)	0.141	0.987
Kheer	44 (44)	5 (14.3)	13 (20)	16 (16)	25.750	0.001
Modak	66 (66)	15 (42.9)	25 (38.5)	48 (48)	14.372	0.002
Chikki	53 (53)	28 (80)	57 (87.7)	37 (37)	49.706	0.001
Groundnut ladoo	61 (61)	23 (65.7)	40 (61.5)	81 (81)	11.398	0.010
Churmura ladoo	11 (11)	23 (65.7)	33 (50.8)	18 (18)	60.253	0.001
Methi ladoo	4 (4)	10 (28.6)	18 (27.7)	18 (18)	20.941	0.001
Til ladoo	22 (22)	26 (74.3)	43 (66.20)	24 (24)	60.400	0.001

Puranpoli	93 (93)	22 (62.79)	44 (67.7)	89 (89)	30.100	0.001
Sweet poha	28 (28)	3 (8.6)	7 (10.8)	4 (4)	26.00	0.001
Sweet rice	32 (32)	5 (14.3)	7 (10.8)	11 (11)	18.930	0.001
Gud poli	42 (42)	12 (34.3)	17 (26.2)	25 (25)	7.952	0.047
Gud puri	39 (39)	8 (22.9)	10 (15.4)	13 (13)	21.900	0.001
Aamras	18 (18)	5 (14.3)	8 (12.3)	3 (3)	11.700	0.008
Sheera	31 (31)	5 (14.3)	10 (15.4)	7 (7)	20.550	0.001
Karanji	30 (30)	5 (14.3)	12 (18.5)	27 (27)	5.200	0.158
Gud papdi	19 (19)	19 (54.3)	44 (67.7)	20 (20)	58.060	0.001
Khaja	14 (14)	4 (11.4)	6 (9.2)	10 (10)	1.171	0.760
Malpua	22 (22)	5 (14.3)	7 (10.8)	8 (8)	8.872	0.031
Kayri panna	3 (3)	4 (11.4)	13 (20)	14 (14)	12.480	0.006
Dink ladoo	40 (40)	6 (17.1)	15 (23.1)	24 (24)	10.670	0.014
Sweet pickle	16 (16)	9 (25.7)	14 (21.5)	16 (16)	2.447	0.485
Gud amba	42 (42)	5 (14.3)	11 (16.9)	49 (49)	26.420	0.001
Chunda	2 (2)	7 (20)	12 (18.5)	5 (5)	20.870	0.001
Sweet bhaji	36 (36)	0 (0)	7 (10.8)	6 (6)	44.420	0.001
Gudamb	19 (19)	5 (14.3)	5 (7.7)	17 (17)	4.202	0.240
Other foods	10 (10)	4 (11.4)	5 (7.7)	54 (54)	71.900	0.001

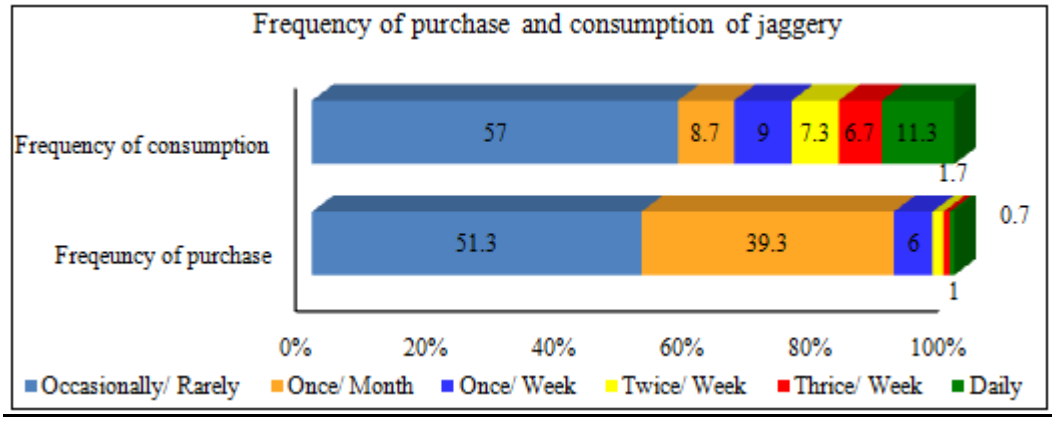

Figure 1: Frequency of purchase and consumption of jaggery

Table 6: Percentage of families using jaggery in preparation of different food products when classified according to religion and type of family

Preparation	**Religion**				**Type of family**			
	Hindu (n=257)	Muslim (n=37)	Chi square	P value	Nuclear family (n=192)	Joint family (n=106)	Chi square	P value
Vegetables	21 (8.2)	7 (18.9)	4.336	0.037	20 (10.4)	9 (8.5)	0.228	0.591
Dal	110 (42.8)	18 (48.60)	0.450	0.502	85 (44.3)	45 (42.5)	0.920	0.762
Usal	12 (4.7)	3 (8.1)	0.790	0.374	8 (4.2)	7 (6.6)	0.849	0.357
Kheer	73 (28.4)	3 (8.10)	6.951	0.008	41 (21.4)	36 (34)	5.027	0.017
Modak	144 (56)	8 (21.6)	15.340	0.001	95 (49.5)	58 (54.7)	0.750	0.386
Chikki	136 (52.9)	33 (89.2)	17.41	0.001	97 (50.5)	76 (71.7)	12.580	0.001
Groundnut ladoo	175 (68.1)	25 (67.6)	0.004	0.949	124 (64.6)	79 (74.5)	3.110	0.078
Churmura ladoo	58 (22.6)	22 (59.5)	22.220	0.001	48 (25)	35 (33)	2.185	0.139
Methi ladoo	33 (12.8)	14 (37.8)	15.050	0.001	27 (14.1)	22 (20.8)	2.226	0.136
Til ladoo	83 (32.3)	26 (70.3)	19.99	0.001	64 (33.3)	50 (47.2)	5.535	0.019
Puranpoli	218 (84.8)	26 (70.3)	4.854	0.028	155 (80.7)	91 (85.8)	1.243	0.265
Sweet poha	40 (15.6)	2 (5.4)	2.726	0.099	18 (9.4)	24 (22.6)	9.928	0.002
Sweet rice	50 (19.5)	5 (13.5)	0.751	0.386	25 (13)	30 (28.3)	10.600	0.001
Gud poli	84 (32.7)	9 (24.3)	1.045	0.307	45 (23.4)	50 (47.2)	17.710	0.001
Gud puri	63 (24.5)	6 (16.2)	1.240	0.266	33 (17.2)	36 (34)	10.800	0.001
Aamras	29 (11.3)	4 (10.8)	0.007	0.932	14 (7.3)	20 (18.9)	9.055	0.003
Sheera	50 (19.5)	3 (8.1)	2.818	0.093	31 (16.1)	22 (20.8)	0.992	0.319
Karanji	68 (26.5)	5 (13.5)	2.904	0.088	55 (28.6)	19 (17.9)	4.206	0.040
Gud papdi	71 (27.6)	27 (73)	29.930	0.001	52 (27.10)	48 (45.3)	10.150	0.001
Khaja	32 (12.5)	2 (5.4)	1.570	0.210	19 (9.9)	15 (14.2)	1.223	0.269
Malpua	42 (16.3)	0 (0)	7.045	0.008	23 (12)	19 (17.9)	1.994	0.158
Kayri panna	29 (11.3)	5 (13.5)	0.157	0.692	17 (8.9)	17 (16)	3.487	0.062
Dink ladoo	79 (30.7)	5 (13.5)	4.703	0.030	39 (20.3)	45 (42.5)	16.540	0.001
Sweet pickle	51 (19.8)	4 (10.8)	1.736	0.188	29 (15.10)	25 (23.6)	3.311	0.069
Gud amba	103 (40.1)	3 (8.1)	14.340	0.001	58 (30.2)	48 (45.30)	6.772	0.009

Chunda	16 (6.2)	8 (21.6)	10.230	0.001	13 (6.8)	13 (12.3)	2.588	0.108
Sweet bhaji	45 (17.5)	3 (8.1)	2.093	0.148	19 (9.9)	29 (27.4)	15.140	0.001
Gudamb	42 (16.3)	3 (8.1)	1.692	0.193	17 (8.9)	29 (27.4)	17.910	0.001
Other foods	68 (26.5)	3 (8.1)	5.946	0.015	47 (24.5)	24 (22.6)	0.127	0.721

Data presented as frequency (percentage)

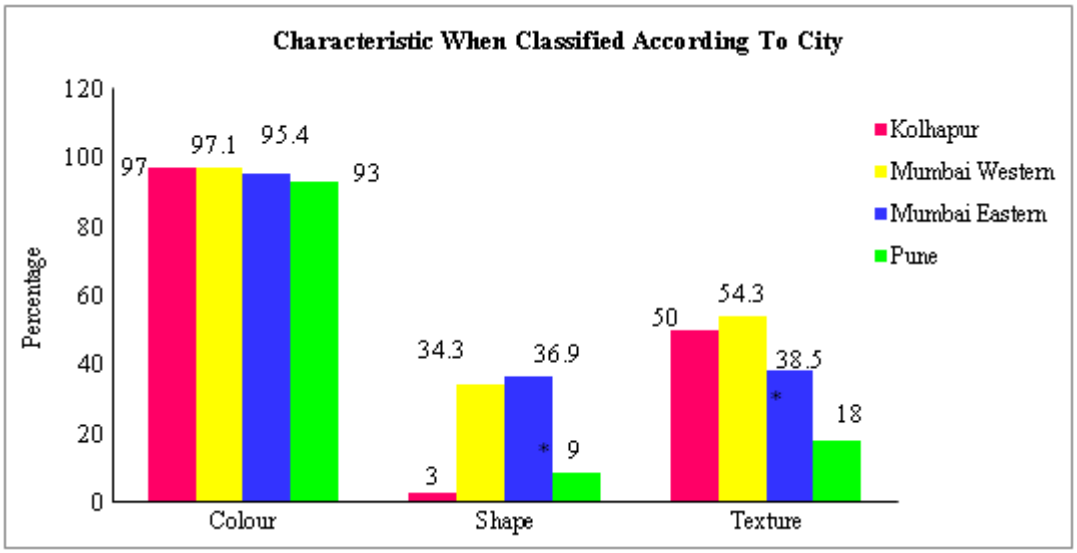

Figure 2: Characteristics of jaggery considered while purchasing jaggery when classified according to City

5. Discussion

In this study it was found that majority of the people prefer jaggery but use sugar instead in their daily routine food preparation, whereas jaggery is used mostly during festivals and on special occasions. It was also seen that the consumption of jaggery was more amongst vegetarians as compared to non vegetarians. In joint families, the intake of jaggery was more than in nuclear families. Amongst various religions it was found that Hindus used jaggery more than did Muslims. When the housewives were asked about the selection criteria considered by housewives, it was seen that colour was the major criterion followed by shape and texture being the least important.

However, although has jaggery health-conferring properties, sugar was generally preferred by almost half of the families. One possible reason could be the cost of jaggery and that it changes the flavor and colour whereas refined sugar does not affect the colour of the product. This may be a consideration for white coloured products like kheer etc. Even in commercial products like chikki and laddoos, sugar is used instead of jaggery since jaggery is a good source of iron.
Although Kolhapur is a major jaggery-producing district, less families from Kolhapur preferred jaggery whereas in Mumbai, preference was given to jaggery. This may be because people in Mumbai had more awareness about the health aspects of jaggery.

Nowadays organic jaggery is available. Itcan be cut into small pieces and added to cereal or even coffee. It can also be chopped up and dissolved in water to form a syrup to sweeten custards, rice, or even poured over ice cream (7).To encourage the use of jaggery in day to day food consumption various ready to eat/ serve jaggery coated food items were developed. (14)

Organic jaggery can be cut into small pieces and added to cereal or coffee. It can also be chopped up and dissolved in water to form a syrup to sweeten custards, rice, or even poured over ice cream (7).To encourage the use of jaggery in day to day food consumption various ready to eat/ serve jaggery coated food items were developed. (14)

One possible limitation of using jaggery in daily food is that it changes the flavor and colour of tea and coffee. However, given its health benefits it should be popularized and housewives need to be educated about using jaggery in daily diet such as preparation of dals and vegetables instead of refined sugar and to encourage the use of jaggery in day to day life in the regular diet and the need to replace sugar with jaggery .

6. Conclusion

Several studies have demonstrated the health benefits of jaggery and the nutritive value of jaggery. In this survey it was found that majority of the people use sugar on a daily basis as compared to jaggery which they mostly use during festivals or special occasions. However many of them prefer jaggery over sugar .the reasons for that were- some of them found it to be more sweeter than sugar, whereas for some it imparts a very nice taste to the recipe. But when asked about using jaggery daily , they said that it does not become practical and convenient to use it daily as most of them add sugar in tea, desserts etc. also many of them consider colour as a major criteria for the selection of jaggery followed by shape and texture. People also thought that jaggery is adulterated so they consider sugar as a safer option than jaggery. There are studies which show that jaggery is adulterated with calcium carbonate to improve colour and to add weight. Sodium bicarbonate is also added sometimes to give a whiter look. Yellow colour is added if the jaggery

gets too white. This may be harmful as these are not edible colours.

Therefore the need for value addition is very important to create awareness amongst people to use jaggery as there are various health benefits of jaggery as demonstrated in various studies. Jaggery is highly nutritious when it is value added with dry fruits, peanuts, amla, ginger etc. as it upgrades its nutritive value with more vitamins, proteins and minerals increasing its biological value which are essential in combating malnutrition. To conclude creating awareness is very important as well taking steps to improve the quality of jaggery by eliminating the adulteration practices. Combination of strategies like supplementation , fortification and public health interventions have to be focused which will help to achieve goals of reducing this preventable condition of malnutrition in rural diets of women in India and jaggery proves as a beneficial repository towards it.

References

[1] Efficacy of jaggery in combating malnutrition prevalent in rural women of India (Anita Sawani, Alkadavid, A.K. Shrivastava and S.P. Shukla)
[2] Nutritional and medicinal properties of jaggery (Saba Hasan, Garima Gupta and Mohammad Israil Ansari)
[3] Nutritional evaluation of instant ladoo mix formulated from sprouted grains and jaggery(K.Padma Dorothy, G.Vijayalakshmi, J. Vineela and P.Sukanya)
[4] Nutritive value of Gur and innovative recipes(RashmiVerma, Kamlesh Rajput Jain and A. Chandra)
[5] Importance and scope for value addition in jaggery based products (A.Nath, J.P.Singh, D. Dutta and B. Gangwar)
[6] Nutritional I portance of jaggery in human diet. (PrabalPratap Singh and SumantPratap Singh)
[7] Organic jaggery : A healthy alternative (Ram Singh , R.K. Rai, Pushpa Singh, A.K.Shrivastav, S. Solomon and NamitaArya)
[8] Optimization of ingredient level for jaggery based energy bar (P.K. More, SagunBhansal and Suman Singh)
[9] Jaggery : prevention and cure of migraine (VaruchaMisra and S.Solomon)
[10] Jaggery: An important component for human health and Ayurveda (Anoop Singh Sachan , Chandra Pal Singh and Lalit Prasad Singh)
[11] Importance of jaggery for nutritional food security of India (Jaswant Singh, D. Kumar, S.I. Anwar, P. Verma, p. Singh and S.solomon)
[12] Value added jaggery: An ideal medicinal indian tonic(V.K. Saxena , R.K.Gautam and B.B. Joshi)
[13] Medicinal properties of jaggery(Neelam Singh, BrahmPrakash , A.K. Sharma and Mohd. Ashfaque)
[14] Development and quality evaluation of selected jaggery based ready to eat / serve products(P.K. Srivastava and A.K. srivastava)
[15] Jaggery / gur in managing malnutrition in children and women (S.P. Shukla, C.P. Prajapati, A. Sawani, R.S. Chaurasia, Amaresh Chandra and A.K. Shrivastava)
[16] www. wikipedia.com
[17] Jaggery: evolution to revolution (sangeetasrivastava, S.I. Anwar, PrasoonVerma, Dilip Kumar, M. Swapna, R.D. Singh, BrahmPraksh, Mohd. Ashfaque, Abhishek Kumar Singh)

Author Profile

Sulakshana D Shinde did MSc.in 2000, Specialization: Food Science and Nutrition. Presently working as Assistant Lecturer at SVT College of Home science, SNDT Womwn's University, Mumbai, Maharashtra, India. She has attended many workshop/ Seminar which includes Ministry of youth affairs, NSS Dept. sponsored workshop for NSS Programme officers on "Adolescent Health". Organized and conducted by Rajiv Gandhi National Institute for Youth Development from 19th to 20th Dec.'05 at Jaipur. Workshop organized by state NSS Cell and Department of Water Supply, sanitation and Health for NSS co ordinator of all university on water and Sanitation in Nagpur, Ravi bhavan on 26th & 27th Sept' 05. Workshop at YASHADA on "Disaster management" 23rd to 25th March 2006 – attended National seminar on Women Fostering a culture of peace by Pune university. 29-11-2007- workshop on content analysis and blue print at P.N. Doshi women's college, /Ghtkopar, Mumbai. 17th February 2008- presented Papper entitled "Eradication of Malnutrition and Diet counseling" at Mama sahib Mohol Mahavidyalaya. Pune in the District Level seminar on NSS Special Camp. 17th February 2008- presented Papper entitled "Eradication of Malnutrition and Diet counseling" at Mama sahib Mohol Mahavidyalaya. Pune in the District Level seminar on NSS Special Camp. September 27-28, 2014- Workshop on "Biomedical Communication Skills Impact On Services Education And Research" at Nanavati Hospital Centre Organised by Kasturba Health Society Medical Research Attended seminar on Food fortification "a drive against malnutrition"at Nirmala Niketan. She has been invited as a Guest/ Speaker. She has many achievements and awards which includes Adarsh mahila award for achievement in social and academic work by rotary club on 8th march 2006. Selected for Pre Republic day Parade camp, held at Abhinav education soc., Ambegoan Pune. Represent as NSS contingent leader of Maharashtra state for Republic day parade camp in New Delhi by Ministry of youth affairs and sports from 1st to 31st Jan 2007. Refresher course in social science-interdisciplinary completed in March 2014. UGC grant received for Minor research Project. Completing her PhD in food processing field