

Jaggery! Do People still Cherish it? A Case Study of Belgaum City, Karnataka

Indrajit A. Doddanavar

Ph. D. Scholar, Jain University Bangalore
jeetu.bgm@gmail.com

Dr. Prashantha C.

Professor and Head, Department of Management studies
SDM College of Engineering & Technology, Dharwad
prashanth.chittaranjan@gmail.com

Abstract

Jaggery in the minds of people is a commodity and does not have technology advancement. From ancient times jaggery is used in Ayurvedic medicine and has spiritual significance. Jaggery has more nutritious as compared to refined white sugar. With the introduction of sugar mills and their multiple growth, improved level of wealth acquisition, easily availability of comfort amenities, easy availability and wide range of products and many necessities at their disposal, demand of jaggery has reduced and demand for white sugar has increased. Also, greed for more yield and profits has made the process unhygienic at the least and poisonous. Therefore, people are also sceptical about the quality and purity. D. B. Agro Industries in Belgaum have adopted sustainable agriculture methods and producing organic jaggery "Madhuramrut" in closed stainless-steel vacuum evaporator's technology. This jaggery is pure and hygiene. The following study is taken up to have an idea about how people view jaggery, to constitute as an input for the branding plan for Madhuramrut.

Keywords: Vacuum evaporated jaggery, Madhuramrut, Knowledge of jaggery.

Introduction

The natural traditional sweetener - Jaggery, is made by the concentration of sugarcane juice. Jaggery has all the minerals, vitamins, polyphenols, etc., that are present in sugarcane juice. So, it is usually called the "healthiest sugar". Also called 'गुडः' in Sanskrit, 'Gur' in Hindi, 'Bellam' in Telugu, 'Vellam' in Tamil, 'Sharkara' in Malayalam, 'Bella' in Kannada, and 'Gul' in Marathi. Jaggery in the minds of people is a commodity and is a saturated commodity market in India. From ancient times jaggery is used in Ayurvedic medicine and has spiritual significance. It has various health benefits (Jaswant Singh, Solomon S and Dilip Kumar 2013; Dr. Michael Saska and Dr. Chung Chi Chou 2012; Arcanjo Francisco P., Pinto Vicente P., Arcanjo Maria R., Amici Márcia R. Amâncio Olga M. 2009). With the introduction of sugar mills and their multiple growth, improved level of wealth acquisition, easily availability of comfort amenities, easy availability and wide range of products and many necessities at their disposal, demand of jaggery has reduced and demand for white sugar has increased (Vishal Awasthi, Rakesh B Gautam, Raj Mani Maurya, Ramjeet Singh, Vikas Yadav, Vishal, Vijay Shankar Yadav, Vijay Shankar Kushwaha and Vijay Pratap 2017). Also, greed for more yield and profits has made traditional jaggery unhygienic and poisonous.

Like other industrial sectors agribusiness faces challenges in the present days. The increase in competition and fast changing consumer demands and expectations, this is due to the ongoing process development in technological field. The awareness of health amongst the people is increasing, and as a result, there is a huge demand for high quality and

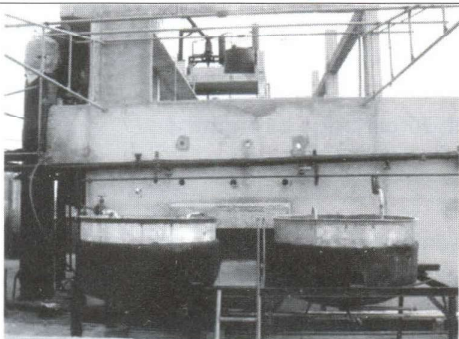

nutritional value food (Straus, T. 2009; Ali, J., Kapur, S. and Moorthy, J. 2010; Sojkin, B., Matecka, M., Olejniczak, T. and Bakalarska, M. 2009; KrystynaGutkowska, IwonaKowalczyk, Marta Sajdakowska, SylwiaŻakowska-Biemans, Anna Kozłowska, Anna Olewnik-Mikołajewska 2014).



But, having said this, Jaggery market is constantly growing and the need for pure and natural product is gaining importance, therefore arises a need of adopting modern technology to produce pure and hygienic jaggery. D. B. Agro Industries in Belgaum has adopted sustainable agriculture methods and producing organic jaggery in closed stainless-steel vacuum evaporator's technology. This jaggery is pure and involves high cost since importance is given to hygiene and capital investment in machineries. Hence, economical, and effective means of marketing, selling, and branding needs to be examined.

Organic Vacuum Evaporated Jaggery is produced by boiling the sugarcane juice in closed stainless-steel multi effect vacuum evaporators using steam heat where the temperature does not exceed 80° C with a low carbon foot print. Due to the low temperature process; all the minerals, polyphenols, flavonoids, vitamins and other nutritional contents present in the sugarcane juice are preserved in the original natural state making them available to the human body.

Advantages and comparison of the Modern Vacuum Evaporation Technology vs Traditional process is shown in Exhibit 1.

Exhibit 1. Modern Vacuum Evaporation Technology vs Traditional process

	Modern Vacuum Evaporation Technology	Traditional process
Working area		
Equipment	All juice contact metal is stainless steel	Juice meets mild steel pan which tends to rust
Juice heating method	Indirect heat using steam heat. Steam generated using 90% bagasse away from the place where jaggery is manufactured	Pan is directly heated on naked fire which uses wood, rubber waste, plastics, tyres, etc., Juice is subjected temperatures more than 300° C
Process temperature	The sugarcane juice and syrup temperature are always less than 85° C	The sugarcane juice and syrup temperature exceed more than 112° C
Adding Chemicals	No chemicals are added	Hydrosis used as bleaching agent (harmful chemical)
Colour	Light brown	Yellow

Form	Powder, granules, nuggets and liquid	Bucket shape moulds and liquid
Working conditions	Clean, safe and worker friendly	Unclean, risky - due to direct contact with fire and boiling juice and unhygienic conditions
Moisture	Less than 1% in Jaggery	Between 15 to 20% in jaggery
Medicinal benefits	Due to low temperature process minerals, polyphenols, flavonoids, vitamins and other nutritional contents are preserved	Since processing temperature is high the natural ingredients of sugarcane juice tend to burn, and formation of the heat generated toxic chemicals like acrylamide are formed
Final product		

Source: Interview with Proprietor, D. B. Agro Industries, Belgaum.

This research article aims at studying the mind set of people in Belgaum city in reference to Jaggery to provide an initial know-how about the people.

Literature Review

In view of the research conducted on jaggery, the literatures are focused on, the cost-revenue ratios of jaggery production, the markets of jaggery, scope of jaggery exports, efficient way of producing jaggery, health benefits of jaggery, etc. Jaggery is still considered as a commodity in India and a rural industry in India which is presumed to have no advanced techniques of manufacturing. The scientific researches acknowledge the fact that jaggery is necessary for human body whereby improves the health as shown in Exhibit 2.

Exhibit 2. Health Benefits of Jaggery

Sl. No.	Author	Source	Paper	Year
01	Thomas Susan	Derivatives Markets in India	The jaggery market at Muzaffarnagar: status and policy recommendations	2003
02	K. C. Sandesh	Thesis, University of Dharwad	Production and export competitiveness of jaggery in Karnataka	2009

03	Arcanjo Francisco P., Pinto Vicente P., Arcanjo Maria	Public Health, Vol. 26(4), pp. 350-354	Effect of a beverage fortified with evaporated sugarcane juice on hemoglobin levels in preschool children	2009
04	JadhavPravin S	Indian Streams Research Journal, Vol. 2, Issue 11	Prospects of Jaggey Industry in Kolhapur District	2010
05	Pawar, Dr. Puja	Jazan University KSA, India	A Study of Jaggey Market in Kolhapur District	2012
06	Dr. Saska Michael & Dr. Chou Chung Chi	Development in sugar technologies	Antioxidant Properties of Sugarcane Extracts	2012

Source: Compiled

Objectives of the Study

1. To assess the awareness of jaggery.
2. To know if people know the modern methods of jaggery manufacturing.
3. To get an insight on what do people think about jaggery

Data Collection

For efficient data collection for this paper, survey with questionnaire is preferred, since methods have been used since a long to get the most relevant information and help coming to proper conclusions through analysis. Survey technique is particularly used in behavioural sciences studies and when a study is based on exploration of quantitative data interview method most preferred. In order to get the most out of this survey, a questionnaire was developed.

Along with demographic variables like age, gender, marital status, educational qualification, occupation, monthly income, the researcher has tried to study the knowledge level of the respondents with respect to the demerits of sugar and the merits of jaggery consumption. Next the respondent has been asked about his knowledge of jaggery manufacturing process.

Sample design

According to Census India 2011, Belgaum city is a municipal corporation. It has 1,11,874 households with a population of 4,90,045 (about 10.25% of the district population) and divided into 60 wards. From this 346 people who were above the age group of 20 years were randomly selected from the consumers who visited 12 retail stores located in various parts of the Belgaum city. Simple random sampling technique is being used for this research paper, so that each person has an equal chance to be selected. Also, this method of sampling was adopted because the questions are of very basic nature which does not require any sort of special knowledge or experience and likely hood of getting responses from a mixed demography is possible. Sample size of 384 the formula $[s=Z^2 \times p \times (1-p)/c^2]$ for sample size calculation. Z = Z value (for 95% confidence level = 1.96), p = percentage picking a choice, expressed as decimal (50% = 0.5), c =

confidence interval or margin of error ($\pm 5\% = 0.05$). Accordingly, 384 questionnaires were administered out of which 346 questionnaires were complete. These 346 questionnaires constituted about 90% of the calculated sample, hence were taken further for analysis.

Data Analysis and Interpretation

Table 1. Age

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 20-30 years	88	25.4	25.4	25.4
30-40 years	196	56.6	56.6	82.1
40-50 years	52	15.0	15.097.1	
50-60 years	10	2.9	2.9	100.0
Total	346	100.0	100.0	

Source: Field Survey

Of the total, 88 (25.4%) respondents fell in the age group of 20 to 30 years, 196 (56.6%) fell in the age group of 30 to 40 years. There were 52 (15%) respondents who fell in the age group of 40 to 50 years. Respondents that constituted the age group 50 to 60 years accounted for 10 (2.9%), as shown in Table 1

Table 2. Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	243	70.2	70.2	70.2
Female	103	29.8	29.8	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the 346 respondents' males accounted for 243 (70.2%) whereas females accounted for 103 (29.8%), as shown in Table 2.

Table 3. Marital Status

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Single	77	22.3	22.3	22.3
Married	257	74.3	74.3	96.5
Divorced	8	2.3	2.3	98.8
Widow	4	1.2	1.2	100.00
Total	346	100.0	100.0	

Source: Field Survey

The married respondents were 257 (74.3%), the unmarried were 77 (22.3%) and were 8 (2.3%) divorcees. There were 4 (1.2%) respondents who were widows of the total respondents, as shown in Table 3.

Table 4. Educational Qualification

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid SSLC or below	1	0.3	0.3	0.3
Below undergraduate	26	7.5	7.5	7.8
Graduate	169	48.8	48.8	56.6
Master's Degree	93	26.9	26.9	83.5
Doctoral Degree	16	4.6	4.6	88.2
Professional course	41	11.8	11.8	100.0
Total	346	100.0	100.0	

Source: Field Survey

Of the 346 respondents there were 1 (0.3%) respondents who had primary education, those who had below undergraduate education accounted for 26 (7.5%) whereas the respondents who had graduate degree constituted 169 (48.8%) of the total respondents. The respondents who had a master's degree were 93 (26.9%), doctoral degree was 16 (4.6%). The professional courses holders accounted for 41 (11.8%) of the total respondents, as shown in Table 4.

Table 5. Occupation

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Student	12	3.5	3.5	3.5
Govt. Employees	24	6.9	6.9	10.4
Self employed	130	37.6	37.6	48.0
Pvt. Company employee	180	52.0	52.0	100.00
Total	346	100.0	100.0	

Source: Field Survey

The student's respondents were 12 (3.5%), government employees accounted for 24 (6.9%), self-employed were 130 (37.6%) and private company employees constituted 180 (52%) of the total respondents, as shown in table 5.

Table 6. Monthly Income of Family (In Rs.)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Less than 10K	24	6.9	6.9	6.9
10-15 K	46	13.3	13.3	20.2
15-20 K	66	19.1	19.1	39.3
20-25 K	62	17.9	17.9	57.2
25-30 K	39	11.3	11.3	68.5
30-35 K	42	12.1	12.1	80.6
35-40 K	30	6.7	6.7	89.3
40-45 K	37	10.7	10.7	100,0
Total	346	100.0	100.0	

Source: Field Survey

Of the total, 24 (6.9%) respondents fell in the income group of less than Rs.10,000 per month, 112 (32.4%) fell in the income group of Rs.10 to 20,000. There were 101 (29.2%) respondents who fell in the group of Rs.20 to 30,000. The respondents that constituted the income group of Rs.30 to 40,000 accounted for 72 (20.8%). Respondents having monthly income above Rs.40,000 were 37 (10.7%) of the total respondents, as shown in Table 6.

Views Regarding White Crystalline Sugar

Table 7.

Eating Sugar leads to Generation of fat and formation of Cholesterol in the body

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	95	27.5	27.5	27.5
Agree	168	48.6	48.6	76.0
Do not know	48	13.9	13.9	89.9
Disagree	27	7.8	7.8	97.7
Strongly disagree	8	2.3	2.3	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 263 (76.1%) strongly agreed or agreed that sugar leads to generation of fat and formation of cholesterol in the body. The respondents who did not know the effect of sugar on fats and cholesterol in body amounted to 48 (13.9%) and there were 35 (10.1%) respondents disagreed or strongly disagreed that sugar leads to generation of fats and formation of cholesterol in the body. The statistics revealed that people are aware that sugar leads to generation of fats and formation of cholesterol in the body, as shown in Table 7.

Table 8.

Eating Sugar leads to Type II Diabetes, Obesity and Heart Diseases

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	105	30.3	30.3	30.3
Agree	178	51.4	51.4	81.8
Do not know	27	7.8	7.8	89.6
Disagree	31	9.0	9.0	98.6
Strongly disagree	5	1.4	1.4	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 283 (81.7%) strongly agreed or agreed that sugar leads to Type II diabetes, obesity and heart diseases. The respondents who did not know that sugar leads to diabetes, obesity and heart diseases amounted to 27 (7.8%) and there were 36 (10.4%) respondents disagreed or strongly disagreed that sugar causes Type II diabetes, obesity and heart diseases. The statistics revealed that people understand sugar causes Type II diabetes, obesity and heart diseases, as shown in Table 8.

Table 9.
Eating Sugar Leads to Tooth Decay

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	116	33.5	33.5	33.5
Agree	137	39.6	39.6	73.1
Do not know	57	16.5	16.5	89.6
Disagree	35	10.1	10.1	99.7
Strongly disagree	1	3	3	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 253 (73.1%) strongly agreed or agreed that sugar leads to tooth decay. The respondents who did not know that sugar leads to tooth decay amounted to 57 (16.5%) and there were 36 (10.4%) respondents disagreed or strongly disagreed that sugar leads to tooth decay. The statistics revealed that people are also aware that eating sugar will have ill effect on the teeth, as shown in Table 9.

Table 10.
Sugar is highly Addictive

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	102	29.5	29.5	29.5
Agree	93	26.9	26.9	56.4
Do not know	77	22.3	22.3	78.6
Disagree	65	18.8	18.8	97.4
Strongly disagree	9	2.6	2.6	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 195 (56.4%) strongly agreed or agreed that sugar is highly addictive. The respondents who did not know that sugar is highly addictive amounted to 77 (22.3%) and there were 74 (21.4%) respondents disagreed or strongly disagreed that sugar is highly addictive. The statistics revealed that people are not so aware that sugar is highly addictive, as shown in Table 10.

Table 11.
Manufacturing of Sugar Involves Chemicals which are Harmful to Human Body

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	116	33.5	33.5	33.5
Agree	110	31.8	31.8	65.3
Do not know	88	25.4	25.4	90.8
Disagree	31	9.0	9.0	99.7
Strongly disagree	1	3	3	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 226 (65.3%) strongly agreed or agreed that sugar is manufactured by using chemicals which are harmful to human body. The respondents who did not know that manufacturing of sugar involves chemicals amounted to 88 (25.4%) and there were 32 (9.3%) respondents disagreed or strongly disagreed that sugar is manufactured by using chemicals which are harmful to human body. The statistics revealed that people are well that manufacturing of sugar involves harmful chemicals, as shown in Table 11.

Table 12.

Sugar can Cause Learning Disorders in School Children

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	73	21.1	21.1	21.1
Agree	78	22.5	22.5	43.6
Do not know	140	40.5	40.5	84.1
Disagree	45	13.0	13.0	97.1
Strongly disagree	10	2.9	2.9	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 151 (43.6%) strongly agreed or agreed that sugar can lead to learning disorders in school children. The respondents who did not know that sugar can lead to learning disorders amounted to 140 (40.5%) and there were 55 (15.9%) respondents disagreed or strongly disagreed that sugar can cause learning disorders in school children. The statistics revealed that people are not that aware that sugar can cause learning disorders in school children, as shown in Table 12.

Views regarding Jaggery

Table 13.

Jaggery is Antioxidant

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	118	34.1	34.1	34.1
Agree	132	38.2	38.2	72.3
Do not know	85	24.6	24.6	96.8
Disagree	7	2.0	2.0	98.8
Strongly disagree	4	1.2	1.2	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 250 (72.3%) strongly agreed or agreed that Jaggery is antioxidant. The respondents who did not know that Jaggery is antioxidant amounted to 85 (24.6%) and there were 11 (3.2%) respondents disagreed or strongly disagreed that Jaggery is antioxidant. The statistics revealed that people are well aware that Jaggery has many antioxidant properties and is beneficial to the human body, as shown in Table 13.

Table 14.
Jaggery can Detoxify the Body

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	96	27.7	27.7	27.7
Agree	121	35.0	35.0	62.7
Do not know	129	37.3	37.3	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 217 (62.7%) strongly agreed or agreed that Jaggery can detoxify the body. The respondents who did not know that Jaggery can detoxify the body amounted to 129 (37.3%). The statistics revealed that most people are aware that eating Jaggery detoxifies the body, but 37.3% people are not aware about this property, as shown in Table 14.

Table 15.
Jaggery has Sizable Amount of Vitamins and Minerals

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	96	27.7	27.7	27.7
Agree	194	56.1	56.1	83.8
Do not know	51	14.7	14.7	98.6
Disagree	5	1.4	1.4	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 290 (83.8%) strongly agreed or agreed that Jaggery has sizable amount of vitamins and minerals. The respondents who did not know that Jaggery has sizable amount of vitamins and minerals amounted to 51 (14.7%) and there were 5 (1.4%) respondents disagreed that Jaggery has sizable amount of vitamins and minerals. The statistics revealed that people are in knowledge that Jaggery has sizable amount of vitamins and minerals which benefits the human body, as shown in Table 15.

Table 16.
Jaggery has Low Glycaemic Index

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	93	26.9	26.9	26.9
Agree	100	28.9	28.9	55.8
Do not know	140	40.5	40.5	96.2
Disagree	12	3.5	3.5	99.7
Strongly disagree	1	3	3	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 193 (55.8%) strongly agreed or agreed that Jaggery has Low Glycaemic Index. The respondents who did not know that Jaggery has Low Glycaemic Index amounted to 140 (40.5%) and there were 13 (3.8%) respondents disagreed or strongly disagreed that Jaggery has Low Glycaemic Index. The statistics revealed that people are well aware that Jaggery is Low Glycaemic Index product, as shown in Table 16.

Table 17.

Jaggery Increases Iron and Haemoglobin in the Body

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	164	47.4	47.4	47.4
Agree	105	30.3	30.3	77.7
Do not know	65	18.8	18.8	96.5
Disagree	8	2.3	2.3	98.8
Strongly disagree	4	1.2	1.2	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 269 (77.7%) strongly agreed or agreed that Jaggery increases iron and haemoglobin in the body. The respondents who did not know that Jaggery increases iron and haemoglobin in the body amounted to 65 (18.8%) and there were 12 (3.5%) respondents disagreed or strongly disagreed that Jaggery increases iron and haemoglobin in the body. The statistics revealed that people are well aware that Jaggery increases iron and haemoglobin in the body, as shown in Table 17.

Table 18.

When Jaggery is used as a Substitute for Sugar, it Reduces Weight

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly agree	121	35.0	35.0	35.0
Agree	100	28.9	28.9	63.9
Do not know	119	34.4	34.4	98.3
Disagree	6	1.7	1.7	100.0
Total	346	100.0	100.0	

Source: Field Survey

Out of the total respondents 221 (63.9%) strongly agreed or agreed that when jaggery is used as substitute for sugar, it reduced weight. The respondents who did not know that When jaggery is used as substitute for sugar, it reduced weight amounted to 119 (34.4%) and there were 6 (1.7%) respondents disagreed that When jaggery is used as substitute for sugar, it reduced weight. The statistics revealed that people are know that when jaggery is used as substitute for sugar, it reduced weight. But still 36.1% do not know or disagree, as shown in Table 18.

Q. Views Regarding Jaggery Manufacturing Process

Table 19.

**Traditional Process of Manufacturing of Jaggery
Involves Unhygienic Methods**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Agree	129	37.3	37.3	37.3
Do not know	175	50.6	50.6	87.9
Disagree	42	12.1	12.1	100.0
Total	346	100.0	100.0	

Source: Field Survey

When asked about their knowledge about the manufacturing for jaggery in Traditional process of involves unhygienic methods 129 (37.3%) respondents said that they agree to the fact. The respondents who did not know that Traditional process of manufacturing of jaggery involves unhygienic methods amounted to 175 (50.6%) and 42 (12.1%) disagreed. This shows that people are do not have enough knowledge about how traditional jaggery manufacturing process is unhygienic, as shown in Table 19.

Table 20.

In Traditional Process of Manufacturing of Jaggery there are no Controls over the Process

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Agree	91	26.3	26.3	26.3
Do not know	213	61.6	61.6	87.9
Disagree	42	12.1	12.1	100.0
Total	346	100.0	100.0	

Source: Field Survey

When asked about their knowledge about the manufacturing for jaggery in Traditional process, has no controls over the process methods 91 (26.3%) respondents said that they agree to the fact. The respondents who did not know that in traditional process of manufacturing of jaggery there are no controls over the process amounted to 213 (61.6%) and 42 (12.1%) disagreed as shown in Table 20. This shows that people are do not know about traditional jaggery manufacturing process.

Table 21.

In Traditional Process of Manufacturing of Jaggery, Product cannot be Trusted

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Agree	186	53.8	53.8	53.8
Do not know	118	34.1	34.1	87.9
Disagree	42	12.1	12.1	100.0
Total	346	100.0	100.0	

Source: Field Survey

When asked about their trust in the manufacturing for jaggery in Traditional process 186 (53.8%) respondents said that they agree to the fact. The respondents who could not say that they have trust or not in traditional process of manufacturing of jaggery amounted to 118 (34.1%) and 42 (12.1%) disagreed and said they trust the traditional process as shown in Table 21. This shows that people are have no trust in the traditional jaggery manufacturing process.

Table 22.
There are Modern Technologies that Produce Jaggery in Hygienic Way

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Agree	42	12.1	12.1	12.1
Do not know	175	50.6	50.6	62.7
Disagree	129	37.3	37.3	100.0
Total	346	100.0	100.0	

Source: Field Survey

When asked about their knowledge about modern manufacturing process for jaggery, 42 (12.1%) respondents said that they agree there are a few modern methods that are been adopted. The respondents who did not know that there are modern technologies that produce jaggery in hygienic way amounted to 175 (50.6%) and 129 (37.3%) disagreed as shown in Table 22. This shows that people are do not know that there are modern technologies that produce jaggery in hygienic way.

Findings

1. Most of the respondents were married male graduates for the age group 30 – 40 years who were employed in private or government having mixed income group.
2. When questions were asked to know their knowledge level of ill effects of sugar, the following information was revealed:
 - a. That people are aware that sugar leads to generation of fats and formation of cholesterol in the body.
 - b. That people understand sugar leads to Type II diabetes, obesity and heart diseases.
 - c. That people are also aware that eating sugar will have ill effect on the teeth.
 - d. That people are not so aware that sugar is highly addictive.
 - e. That people are well that manufacturing of sugar involves harmful chemicals.
 - f. That people are not that aware that sugar can cause learning disorders in school children.
3. When questions were asked to know their knowledge level of healthy effects of jaggery, the following information was revealed:
 - a. That people understand Jaggery has many antioxidant properties and is beneficial to the human body.
 - b. That most people are aware that eating Jaggery detoxifies the body and, but about half of the people are not aware about this property.

- c. That people are in knowledge that Jaggery has sizable amount of vitamins and minerals which benefits the human body.
 - d. That people understand Jaggery is Low Glycaemic Index product.
 - e. That people understand Jaggery increases iron and haemoglobin in the body.
 - f. That people are known that when jaggery is used as substitute for sugar, it reduced weight. But still 36.1% do not know or disagree.
4. When questions were asked to know their knowledge level of jaggery manufacturing process, the following information was revealed:
- a. That people are do not have enough knowledge about how traditional jaggery manufacturing process is unhygienic.
 - b. That people do not have enough knowledge about traditional jaggery manufacturing process.
 - c. That people do not have enough trust in the traditional jaggery manufacturing process.
 - d. That people are do not know that there are modern technologies that produce jaggery in hygienic way.

Suggestions & Conclusion

From the above data and the analysis, it is concluded that most of the respondents are aware that consumption of sugar could lead to ill effects on the body. People also do consider jaggery as healthy and have a fair amount of knowledge. But when it comes to the manufacturing process people do not have trust and knowledge. Many people do not know that there are modern methods and process by which pure hygienic product with less moisture can be got.

It is suggested that, D. B. Agro Industries needs to market their product Organic Vacuum Evaporated Jaggery – Madhuramrut by informing the public about their process and how their product is better than the traditional jaggery. It is also noted that more stress is given to the benefits of jaggery to human body. The target audience should be all people who are 25 years and above. Madhuramrut should be positioned separately than jaggery and as a much superior product than jaggery.

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