Review Article

An analysis of Tamil Nadu income-based consumption patterns and consumer behaviour for Jaggery and Khandsari sugar: A Review

Abstract:

Markets such as Coimbatore, Tiruppur and Erode district Jaggery Cooperative Jaggery Marketing Federation (CTEDCJMF), Selur Farmers Sugarcane Products Market (Farmers jaggery market), Pilikalpalayam and Chitthode jaggery market exclusively for jaggery and khandsari sugar, coconut and palm sugar. Snowball sampling method was used for the data collection and also producers, visiting the market also enrolled in the study. Totally 30 producers of each sugar, 60 middlemens and 120 consumers who purchased sugar through the identified marketing channels were interviewed for the study.The data collected were analyzed the cost and returns for three types of sugar, price spread at various of marketing, traders concentration ratio, buying behavior of consumers towards alternate forms of sugar, principal component analysis used to identify the factors influencing the consumers purchase towards alternate forms of sugar. Garrett's ranking technique was used to analyze the problems faced by the producers and middlemens in marketing the alternate forms of sugar.The results of the sample respondents showed that sample respondents of jaggery and khandsari sugar producers, majority of the sample respondents were aged between 31-40 years (33.33%) followed by 26.67 percent in the category of 20-30 years, about 23.33 per cent of the sample respondents in the producer category were aged above50 years, followed by 16.67 per cent aged between 41-50 years. Hence, the demand for coconut sugar is very low so that promotional efforts should be made to popularize the health benefits of coconut sugar among the consumers. In case of jaggery and khandsari sugar, product modification in the form cube sugar (similar to white sugar cubes) will increase the market preference and acceptability.

Keywords: Jaggery, khandsari sugar, genetically modifies organisms

UNDER PEER REVIEW

Introduction

Today the World is conscious about sweeteners due to increasing threat of diabetes, obesity, hypertension and heart diseases and many other related concerns due to high consumption of sugar in food, beverageand confectionary products. Nowadays, many sugar free and synthetic sugar products are abundantly available in food markets. However, it may be unsafe and unhealthy, as there was a possibility to cause side effects (*Asghar, 2019*). In this case, natural sweeteners with low glycaemic index (GI) could be an alternate solution to the diabetes problem. With this background, the present study was proposed with the objective about the market demand for alternative forms of sugar such as Khandsari sugar, Palm sugar and Coconut sugar, as these were having low glycaemic index compared to white sugar. The traditional way of processing sugar is coming backin track. The white sugar industry in India is an organised sector, whereas the market for alternate sugar is an unorganised one. According to the *Indian mirror*, there were 453 sugar mills of which 252 were cooperative and the over 134 were private. Indian sugar industry is self-sufficient in its vigour needs and also makes surplus exportable power through cogeneration. But due to excess supply, nowadays cane mills were facing issues in terms of clearing debts to farmers and as well as the government. In this regard, alternative forms of sugar resolves this issue by providing better prices to farmers and also in sustaining the sugarcane production. It also paves way for employment in securing rural livelihood. Further, the never ending demand of high quality, green & clean labelled, organic, nutritious food products amongst the diet conscious people had influenced food processing sector to innovate and add value to the existing product line with a view to provide health and wellness to its consumers (*Mohan and Agarwal, 2020*). Importance of sweeteners had long been recognized in Indian diets. In today's scenario, people are consuming their choice towards alternative forms sugar than white sugar due to various health issues.

Indigenous science often called as folk knowledge, western science or traditional ecological knowledge (*Duit, 2007*). Indigenous science was still in the form of concrete experience knowledge, while scientific knowledge was in the form of concept, principle,

UNDER PEER REVIEW

theory or reproducible laws (experimentally tested in laboratory) based on scientific work, have been asserted by scientific community, objective, universal, value-free process. The range of indigenous science knowledge includes chemistry, biology, physics, agriculture, ecology and medical *(Battiste, 2005).*

Science knowledge curriculum was develop from local culture and grows strong nationalism attitude. Local culture exploration was important to understand local knowledge that was integrated in the school, so cross culture approaching was used if science knowledge in the school can be balanced between western science (modern science) and traditional science (indigenous science).

The most popular sweetener in the world, sugar, was invented in India. There was reference to sugarcane cultivation and preparation of sugar in an Indian religious text, the "Atharva Veda". The word sugar is a derivative of "Sakara", meaning gravel in Sanskrit. Sugar was introduced when the army of Alexander the Great came to India in 327 BC. Interestingly, they were surprised to see alternative to honey to sweeten food, and described it as a "reed that gives honey without bees". (*National Federation of cooperative sugar fact*).

Agroindustry played a very important role in supporting the economy and employment generation*(Pakasi, 1998)*. One of the industries that thrive in rural areas was the palm sugar agroindustry, with material of liquid *Borassus flabellifer*. Agroindustry had an ability to absorb labourupto 68 per cent of total workforce available in rural areas *(Aliudin and Cahyadi, 2019*).

Plantation sector was one of the agricultural sectors that were traditionally able to generate foreign exchange for the country through export of agricultural products. Most of the plantations belong to smallholders, while the rest was large plantations that belong to government and private companies. To add value to the commodities, agroindustry should be established. Thus, an approach to the agribusiness of plantations had an important role to play. The system of plantation agribusiness consists of production subsystem, processing subsystem, marketing subsystem and supporting system or was a complex and dynamic system. Therefore, the development of plantation agribusiness ideally employs an agribusiness system, including the upstream and the downstream subsystems, in order to add value to the commodities, one of which was sugar palm trees (*Nuraini and Atmaja, 2019*)

UNDER PEER REVIEW

Processing industry had a role in economic growth of a region through marketing needs both domestically and abroad (*Rejekiningsih et al. 2011*). Traditionally, any occasion in India was celebrated with sweets and was customary to "sweeten the mouth" after every meal, any joyous occasion, religious festival and social gathering. Indian religious offerings mostly contain five amrits (elixirs) like milk, curd, ghee (clarified butter), honey andsugar; these indicated the importance of sugar not only as a food item but also as an essential, toIndian way of life. While sugar has of considerable cultural and hedonic relevance in India, nutritionally it provides only "empty" calories (1g of sugar gives 4 k cal). It lacksnatural minerals which were present in beetroot or sugarcane.

There was a strong relationship between calorie intake and obesity. In India, the prevalence of obesity was increasing at a rapid pace due to an increase in energy intake owing to increase in purchasing power and availability of high fat, energy-dense foods, along with reduction in the energy expenditure consequent to urbanisation and mechanisation *(Mishra et al., 2013)*. Parallel to the rise in obesity, prevalence of metabolic syndrome and type 2 diabetes mellitus (T2DM) was increasing in India and has reached epidemic proportions. The estimates in 2019 showed that 77 million individuals had diabetes in India, which is expected to rise to over 134 million by 2045 (*Pradeepa and Mohan, 2021*).

Sugar Consumption in India

Data from India sugar trade industry (2013) revealed that India is the second largest producer and largest consumer of sugar in the world (USDA Report, 2014). Most of the khandsari sugar was consumed in rural areas for household consumption and feed use (*Solomon, 2014*). According to the report, 6-8 MT utilised for jaggery and khandsari sugar to meet for domestic requirements of sweeteners. These sugars were decentralised sector, which provides employment to the rural population and also had great export potential. However, jaggery and khandsari sugar was prepared by local sweets manufacturers; mostly consumed in rural areas for household consumption and feed use.

Sugar-sweetened beverages (SSBs) include full spectrum of aerated drinks, fruit drinks, and energy and vitamins containing added sugars. Many of these beverages were

UNDER PEER REVIEW

sweetened with high fructose corn syrup (HFC's), most common added sweetener in processed foods and beverages, and some with sucrose or fruit juice concentrates.

In Indian context, available databases do not define sugars clearly, however, from the data breakdown it appears that "sugar" means white sugar honey and was one of the household agro-industries thathad been run for a long time by the rural peoples in some areas of Tamil Nadu. Sugar processing business was an effort to diversify sugar and increase of utilization of palm sap economically, and stimulate the participation of rural communities in increasing family income, even though processing was still using simple equipment's or done traditionally with limited human resources *(Abdullah et al., 2014*). Generally, these sugar processing business in western Tamil Nadu, are characterised by very simple technology and rely solely on family labour or even done by one or two people. Increase of traditional sugar has been seen in recent years. Regarding domestic demand, the biggest demand for granulated sugar comes from food and medicine industries across the country. The rise in demand for natural materials and innovative products werepositively influenced this traditional sugar market. Global food industries were shifted to use natural or organic sweeteners. Therefore, Jaggery and Khandsari sugar, Palm sugar and Coconut sugar could be an alternative source of sugar for the consumers. However, consumers from Asia-Pacific regions, such as Indonesia, India and Philippines, preferred Palm sugar. People from India also preferred these alternate forms of sugar. People have begun to realize that these alternate forms of sugar benefits their health. Due to health reasons, manufacturers and suppliers of food and beverages productswere optimized the product offering in accordance with the consumer demand. Some manufacturers were successfully paved way to traditional sugar markets as they could obtain high profit margins. These factors were predicted to push growth of global market income for alternate forms of sugar. However, people were getting more conscious of health. As a result, organic and healthy foods were in greater demand. Sugar was not only of the world's key food commodities but also one whose appearance and sensation on the palate have long been subject to radical change. Sugar as we know was a relatively stable, storable and tradable commodity made from boiling down sweet juices of grass-originated canes.

Coconut sugar and Palm sugar

UNDER PEER REVIEW

Coconut sugar produced from coconut sap -Neera sugar obtained from coconutneera, sweet sap of the palm, was fast becoming a popular drink on account of its highly nutritive value, delicious taste and agreeable flavour. Central government was trying to develop neera clusters under the Scheme of Fund for Regeneration of Traditional Industries (SFURTI). GramodyogSangh, which undertakes programmes to help those who tap the palm trees, has under its fold 50 co-operative societies or institutions. Khadi and Village Industries Commission (KVIC) implement the scheme. Apart from increasing availability of the drink, Neera cluster aimed at generating more employment for tappers.

Coconut sap could be a better potential source for the production of healthier sugar (*Asghar et al., 2020*). The income from palm sugar is 5-10 times higher than income from copra products(*Novariantoet al.,2021*).The main advantage of coconut sugar was that its glycaemic index value was relatively low at 35-42, and it was a safe sweetener for diabetes (*Trinidad et al., 2010)*. Coconut sugar also had sufficient nutrition compared to granulated sugar (cane sugar).

Coimbatore, Erode District Co-operative Jaggery Marketing Federation (CTEDCJMF),Kunnathur which was functioning exclusively for coconut sugar and palm sugar. There were 9 federations in Tamil Nadu all functioning under KVIC and 13 co-operative societies functioning under this federation. Auction for coconut sugar and palm sugar done in every monday in Kunnathur, tuesday in Siruvallur, friday in Pallagoundenpalayam and sunday in Perundurai. Producers market their produce in the auctioned price in market upto next auction day. Palm sugar production takes place from January to July whereas coconut sugar takes place throughout the year. Palmyrahwas one of the most valuable and important trees in India. It was not indigenous to this country but was extensively cultivated as it readily propagates itself in regions where it was abundant; it was also found growing wild. The use of various parts of the tree was innumerable. Palm Products Industry was also one of the major cottage industries under the Village Industries Sector in the State. Tamil Nadu is a pioneer in development of Palm Products Industry in India andwas declared as the "State Tree" of Tamil Nadu. The State earns foreign exchange by exporting palm products and could last more than 100 years.

UNDER PEER REVIEW

Palm trees easily germinate and grow, both in domestic and wild environment. Tamil Nadu Palm Products Development Board was functioning since 1995 and engaged in the introduction of modern concepts to promote research for the development of palm products industry and for better utilization of palm products with social objective of uplifting economic condition of rural palm gur artisans.

Palm sugars had been used as a traditional for thousands of years in Asia. It is now gaining popularity globally because of its natural source, minimal processing and healthiness. One of the major health claims is its glycaemic index (GI). Palm sugars were normally marketed as low GI foods, though only a few published papers were evidence *(Srikaeo and Thongta, 2015*). Palm sugars were minimally processed unrefined and contain natural sugars. They could present nutritionally significant quantities of minerals and vitamins, including antioxidant properties (*Victor and Orsat, 2018*).

Palm jaggery was highly priced due to its medicinal properties and there was need of developing standard process as well as mechanisation for the same. There was a need to improve low cost palmyrah climbing device through greater mechanisation, system of tapping, improved efficiency in the collection process, reduced chances of contamination and improve shelf life without sacrificing the exotic flavour that makes sap a favourite of so many. Further, the product needs improved market promotion and marketing (*Sankaralingam et al, 1999*). The global market of palm sugar consists of local and the regional market players 70 per cent to 75 per cent local players were estimated to dominate the market.Benefit externality in Palm sugar industry was that Palm trees producing sap to make palm sugar have ecological values.

Jaggery and Khandsari sugar

Gur had been manufactured in India from time immemorial. Till the advent of the modern sugar industry, the cane crop was marketed primarily in the form of gur. However, with increasing specialisation of economic functions farmer findself-processing of his producequite irk-some. Organised gur manufacturers had come into being to buy his cane. In a way, it was a good development for it releases a good deal of labour and bullock resources for other agricultural operations at a time when the farmer was hard-pressed for these inputs. But the growth of these gurmanufacturers has created problem in a way that they now divert substantial quantities of cane away from the sugar industry.

UNDER PEER REVIEW

Khandsari sugar production rested with only unorganized sectors and mainly these were represented under cottage industries. Alternate forms of sugar were the major agro processing industries found in rural sectors of our country. Khandsari sugar was also termed as Cottage sugar which was obtained in unrefined crystalline form from small scale industries. In Tamil Nadu major production of Khandsari sugar areas were Erode, Namakkal, Salem and Dindigul districts. Pilikalpalayam of Namakkal district, farmers were jointly organised a licensed market for jaggery and khandsari sugar marketing to sell their produce and to get better price for them. Here all producers were sugarcane farmers and very few were only processors. In Erode district, khandsari sugar market was located at Kavindapadi and Chitthode and both farmers and processors got better price. Neera sugar was produced by Farmer Producer Companies (FPC). Major production was done in Coimbatore and Erode districts. Palm sugar was obtained from tree Palmyrah where production was mainly in southern Tamil Nadu. Keeping this in view, this study explored the market demand for alternate forms of sugar in the study area.

Processing of Jaggery and Khandsari sugar

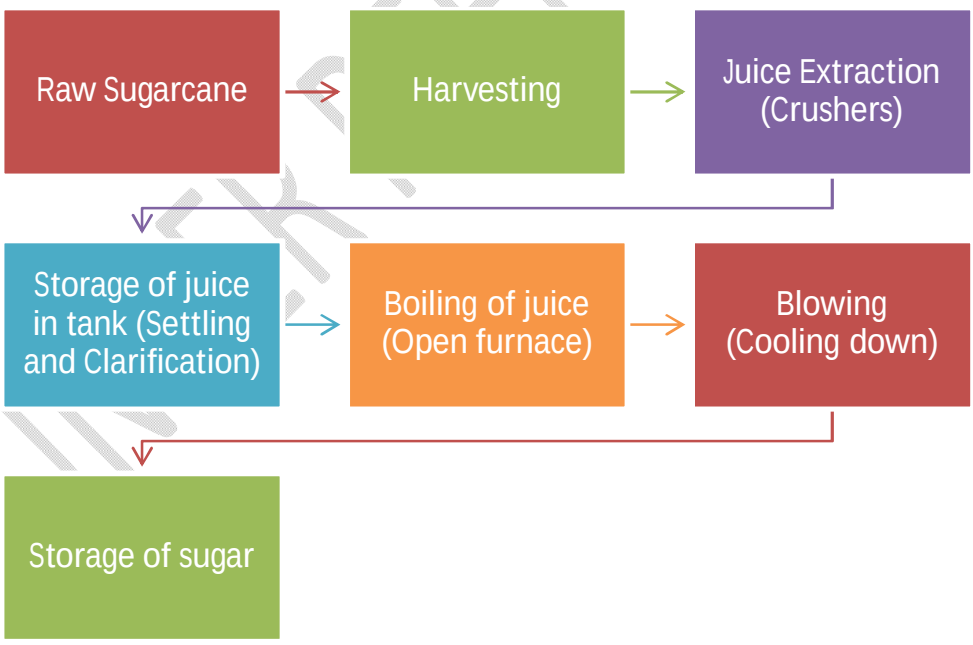

Fig. 1. Processing of Jaggery and Khandsari sugar

Figure .1 revealed about the jaggery and khandsari sugar processing where harvested raw sugarcane was purchased from the farmers and within two days of time it

would be crushed to extract juices. However, before going for boiling the juice will be clarified i.e removing of impurities present in juice, as the harvested sugarcane would be processed directly from field without doing any activities. The juice was boiled in open furnace for three hours until it reached the brix value. After reaching the brix value, blowing process cools down the sugar. Finally based on demand, the processed liquid form would be moulded into a wooden box to get desired shape whereas for khandsari sugar after it reached a brix value, they would again be transferred into aopen wooden box and starts to break clods by traditional method or machine. Here, process for jaggery and khandsari sugar varies at the last stages.

Processing of Palm sugar

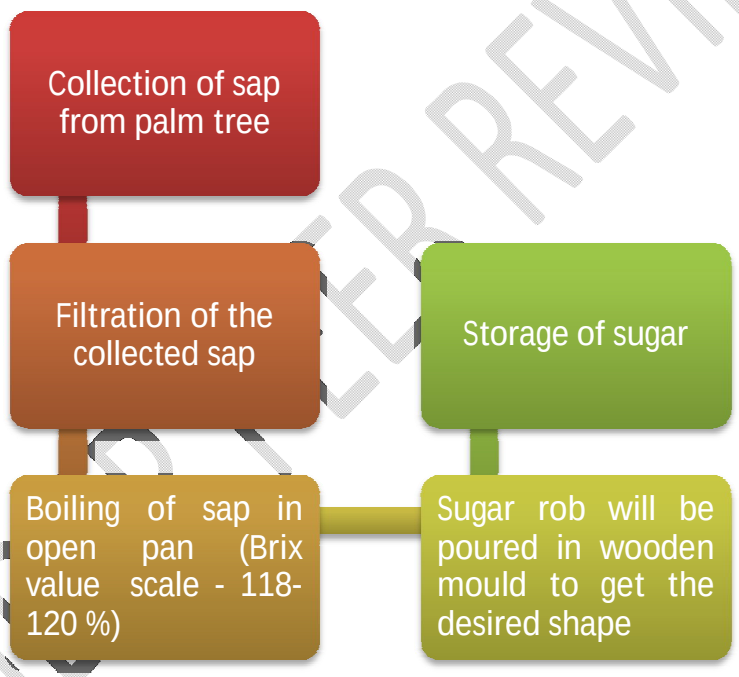

Fig. 2Processing of palm sugar

Figure..2 depicts about the processing of Palm sugar. Palm sap would be collected from the tree which would be tapped. Then the collected sap would be filtered and boiled. These kinds of sugar are processed at a low scale but had a greater economic value. The boiling process takes place for about two to three based on boiling capacity until reaches a brix value of about 118 to 120 per cent. Then the sugar rob (which was partially liquid and solid in consistency) was poured into a wooden box and kept for about two hours. Then palm jaggery obtained was stored. Here, the producers produce sugar for about a

UNDER PEER REVIEW

period of six months (January to June) and from 18 litres of palm sap about 1.75 kg of sugarwas obtained. Collected sap would be processed within two hoursof time. Hence, the producers tap the sap from tree in the early morning and start to process once collected.

Processing of Coconut sugar

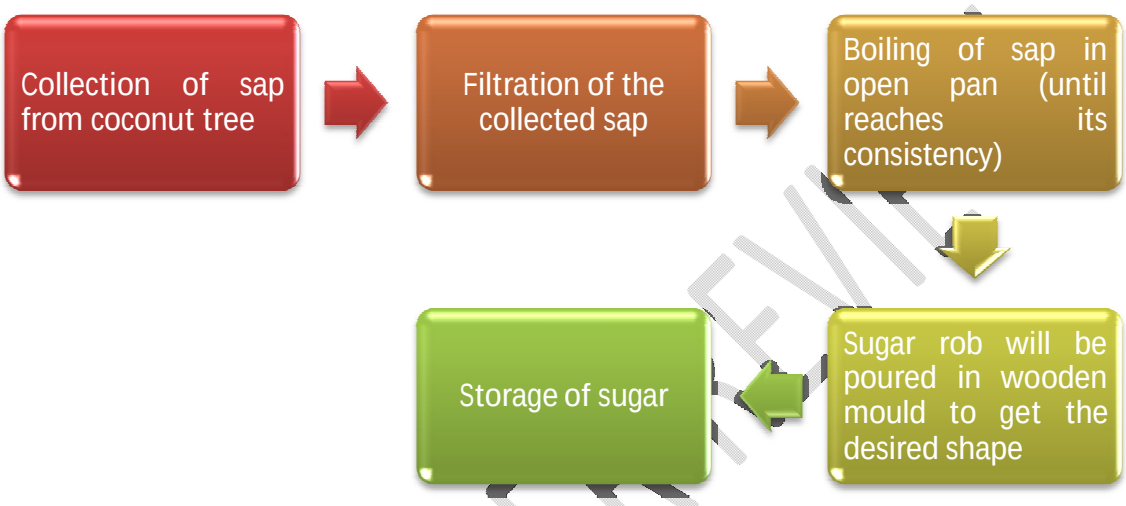

Fig. 3 Processing of coconut sugar

Figure..3 depicted various processing stages of coconut sugar which acts as home industry in many rural areas. The process wassimilar as in palm sugar processing. Here, tapping would be done in inflorescence of the tree as in palm tree. Producers will tap sap from the tree and start to produce within two hours. The problem that they faced was maintaining temperature to increase shelf life for two more days. They boil the liquid sap in an open pan andonce the consistencywas reached, sugar rob would be poured into wooden box to get the shape. After two hours, preferred size was obtained and taken for storage and then soldto market or other purposes based on their convenience. About 250 litres of sap would yield 40 kilograms of sugar.

UNDER PEER REVIEW

Conclusion:

Through technical research, the current investigation aimed to paint a picture of jiggery production in which the producer receives a fair price for their output to cover all costs spent along the process. A lot of producers find it difficult to incorporate new technologies into their operations. These industries' development will make issues like unemployment and low educational attainment easier to handle. Increased productivity and longer product shelf life are two benefits that manufacturers receive from additional research and development in these areas. These kinds of studies will have a bright future because automation does not exist. This will facilitate the recruitment of young entrepreneurs by offering a range of subsidies. By offering a range of subsidies, it will readily inspire and draw in young entrepreneurs to start these kind of business

References:

Abbot, J. C. and Makeham, J. P. 1981. "Agricultural Economics and Marketing in the Tropics." *Wing Tai Cheung Printing Co. Ltd*, Rome. 58

Abdullah, Weka Gusmiarty, Usman Rianse, Raden Marsuki Iswandi, Sitti Aida Adha Taridala, Ilma Sarimustaqiyma Rianse, Zulfikar La Zulfikar, Weka Widayati, La Rianda Baka, Abdi La Abdi, and Edy Cahyono. 2014. "Mathematical Model of Factors Influencing the Consumption of Brown Sugar in Southeast Sulawesi." *2014 Proceedings of the 2th International Conference on Mathematical, Computational and Statistical Sciences (MCSS'14).*

Anubha (2021). Marketing of Jaggery in India. *Just Agriculture – Mutlidisciplinary e-Newsletter* 1(8): 1-8.

Arvola, Anne, Arttu Malkamäki, Juho Penttilä, and Anne Toppinen. 2019. "Mapping the future market potential of timber from small-scale tree farmers: Perspectives from the Southern Highlands in Tanzania." *Small-scale Forestry* 18 (2):189-212.

Boban Melovic, Dragana Cirovic, Branislav Dudic, Tamara Backovic Vulic, Michal Gregus. 2020."The Analysis of Marketing Factors Influencing Consumers' Preferences and Acceptance of Organic Food Products—Recommendations for the Optimization of the Offer in a Developing Market."*Foods*9:259.

UNDER PEER REVIEW

Bagchi, Niladri Sekhar, Pulak Mishra, and Bhagirath Behera. 2021. "Value chain development for linking land-constrained farmers to markets: Experience from two selected villages of West Bengal, India." *Land Use Policy* 104:105363.

Bernat, Neus, Maite Cháfer, Amparo Chiralt, and Chelo González-Martínez. 2014. "Vegetable milks and their fermented derivative products." *International Journal of Food Studies* 3 (1).

Bin, JM, SM Emmanuel, and BN Theodore. 2019. "The Structure-Conduct-Performance Paradigm: An Empirical Analysis of Cameroon Firms." *Journal of Business Economics and Management* 7:316-323.

Collins, C Matilda, Pauline Vaskou, and Yiannis Kountouris. 2019. "Insect food products in the western world: Assessing the potential of a new 'green'market." *Annals of the Entomological Society of America* 112 (6):518-528.

De Figueirêdo Junior, HS, MPM Meuwissen, and AGJM Oude Lansink. 2014. "Integrating structure, conduct and performance into value chain analysis." *Journal on Chain and Network Science* 14 (1):21-30.

Deshpande, VV. 1999. "Industrial and policy issues including export potential of jaggery and khandsari." Proceedings of the National Seminar on Tatus, Problems and Prospects of Jaggery and Khandsari Industry in India, Lucknow, India.

Kausadikar, HH, SR Nagargoje, and KV Deshmukh. 2019. "Profitability of sweet orange in Marathwada region." *Journal of Pharmacognosy and Phytochemistry* 8 (4):255-258.

Kirimi, Lilian, Nicholas Sitko, Jayne TS, Francis Karin, Milu Muyanga, Megan Sheahan, James Flock, and Gilbert Bor. 2011. "A farm gate-to-consumer value chain analysis of Kenya's maize marketing system."

Kizito, A. 2008. "Structure- Conduct-Performance and food security." FEWS NET Markets Guidance, No.2. Washington DC, USA: USAID.

Knorr, D, and MA Augustin. 2021. "From value chains to food webs: The quest for lasting food systems." *Trends in Food Science & Technology* 110:812-821.

UNDER PEER REVIEW

Mohan, Narendra, and Anushka Agarwal. 2020b. "New ventures of value-addition in jaggery processing for a dynamic sugar industry." *International Journal of Engineering Research & Technology* 9 (1):291-294.

Mohapatra, Upasana, and Suvashree R Prusty. 2017. "A study on marketed surplus, price spread and marketing efficiency of the winter vegetables in Dhenkanal district of Odisha." *International Journal of Farm Sciences* 7 (1):170-174.

Monteiro, S, M Pereira, I Branco, and AC Reis. 2017. "Value Chain Mapping Methodology: a proposal for a process mapping project." Valencia, Spain: International Joint Conference-ICIEOM-ADINGOR-IISE-AIM-ASEM.

Muhaimin, Abdul Wahib, V Wijayanti, and LM Yapanto. 2019. "Analysis of Market Structure, Conduct and Performance of Corn (Zea Mays L.) in Kedung Malang Village, Papar District, Kediri Regency, East Java." *International Journal of Civil Engineering and Technology (IJCIET)* 10:10-16.

Murthy. S. R. S. 2010. Economics of Sugarcane production and processing., Occasional Paper – National Bank for Agriculture and Rural Development, Mumbai, (54).

Nagaraj, BV, and YT Krishnegowda. 2015. "Value Chain Analysis for Derivedproducts from Paddy: A Case of Karnataka State." *International Journal of Managing Value and Supply Chains* 6 (1):47.

Nikonova, Natalia, and Aleksey Nikonov. 2022. "Analysis of Potential Demand in the Market of Organic Milk and Dairy Products." In *Agriculture Digitalization and Organic Production*, 181-193. Springer.

Pakasi, C. B. D. 1998. “Domestic Industry and small Industry Development Alcohol Nira Aren in Minahasa.” *Journal agro-economic*, 16(1).

Pradeepa, Rajendra and Viswanathan Mohan. 2021. “Epidemiology of typr 2 diabetes in India” *Indian Journal of Ophthalmology* 69(11): 2932.

Prayuginingsih, Henik, Teguh Hari Santosa, M Chabib Ichsan, and Noor Salim. 2017. "Contribution of wmen on Family Income and Marketing of Coconut Sugar Home Industry at district of Jember." *Prosiding Strengthening Local Communities*

UNDER PEER REVIEW

Scarborough, V. and Kydd, J. 1992. Economic Analysis of Agricultural Markets: A Manual. Chatham, U.K. Natural Resource Institute.

Scherer, F.M., 1980. Industrial market structure and economic performance. 2nd Edition. Rand McNally College Publishing Agency, USA. 342p.

Singh, Ram, SM Feroze, and Shiv Kumar. 2020. "Production of turmeric in North East Hill Region of India: A value chain analysis." *Indian Journal of Agricultural Economics* 75 (4):359-374.

Sivathanu, Brijesh. 2015. "Factors affecting consumer preference towards the organic food purchases." *Indian Journal of Science and Technology* 8 (33):1.

Solomon, S. 2014. "Sugarcane agriculture and sugar industry in India: at a glance." *Sugar Tech* 16 (2):113-124.

Srikaeo, K, and R Thongta. 2015. "Effects of sugarcane, palm sugar, coconut sugar and sorbitol on starch digestibility and physicochemical properties of wheat based foods." *International Food Research Journal* 22 (3):923.

Victor, Inneke, and Valérie Orsat. 2018. "Characterization of Arenga pinnata (palm) sugar." *Sugar Tech* 20 (1):105-109.

Vijayabaskar and Sundaram. 2012. "A Market Study on key Determinants of Ready-to-Eat/Cook Products with respect to Tier-I cities in Southern India." *International Journal of Multidisciplinary Research* 2(6): 168-180.

Waddle Ashleigh, D. (2009). A Market Analysis for Specialty Beef in Virginia. Virginia Polytechnic Institute and State University.

Wesman, L.(2005). Assessing market power: The trade-off between market concentration and multi-participation. Journal of Competition Law & Economics. Vol 1 (2), pp. 339-354.

Wier, Mette, and Carmen Calverley. 2002. "Market Potential for Organic foods in Europe." *British Food Journal* 104(1).

Williams, R. Tee. 2011. "An Introduction to trading in the financial markets: trading, markets, instruments, and processes." *Elsevier Monographs*: 31-71.

UNDER PEER REVIEW

Yueh-Chiang, Lee, and Yang Yao-Hung. 2016. “Analysis of Industrial Structure, Firm conduct and Performance – A case study of the textile industry.” *Autex Research Journal* 16(2): 35-42.

Zainal Abidin Umar (2016). The Development Strategy of Coconut Sugar. *The International Journal of Engineering and Science* 5(3): 58-66.

UNDER PEER REVIEW