SHARKARA

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It contains……..

From Director's Desk…

Indian Sugar Industry has created records for ever highest sugar production (35.9 MMT), highest ever sugar exports (11.0 MMT) and production of ethanol for blending in petrol. On ethanol front, the performance is going to be exemplary and the industry is likely to achieve desired blending targets of 10% during the current alcohol year. The ethanol production till now during the current year reached to about 346 crore litre which is about 15% higher than the preceding year. The country has now ethanol capacity of 925 crore litre per annum while the country needs ethanol capacity of 1700 crore litre per annum to meet requirements for E20 and for other uses. In pursuit of exploring new feed stocks, IOC set up a 2G ethanol plant at Panipat for Rs. 900 crores which was inaugurated by Hon'ble Prime Minister on World Biofuel Day.

A welcome move by the Indian Sugar Industry has been for converting Double Sulphitation Plants to Raw-Refined Sugar Plants about which NSI, Kanpur was trying to create awareness from last couple of years. While it would enable sugar factories to produce sugar meeting requirements for exports and domestic consumption through a more environment friendly process with lesser requirement of process chemicals. It is heartening to see sugar factories now adopting environment and consumer friendly packaging of sugar which I hope will increase with advent of shopping malls. The industry is also now adopting production of specialty sugars looking to sector specific requirements to earn value addition.

Production of Compressed Bio-gas from filter cake although has been taken up but is still facing several challenges and the issue of supplies, utilization of liquid fertilizer and maintaining quality of filter cake for round the year operation are still to be addressed. Institute is continuously working on various fronts to see development of innovative technologies for producing value added products from waste and by-products of the sugar industry. Institute is working on developing many newer technologies viz. juice concentration by reverse osmosis, use of SMBS as a replacement for sulphur di-oxide gas, mechanical clarification of cane juice and fortification of sugar etc.

On the academic front, the academic session 2022-23 commenced from July 2022 and the period remained vibrant with many academic and other students related activities. On the employment front, the picture remained rosy as most of the students from Sugar Technology, Sugar Engineering, Alcohol Technology and other courses got placements in reputed companies through campus recruitment. The Council of Students' Activities and Old Boys' Association of the institute organized many programmes on Teachers Day and Foundation Day of the institute with great enthusiasm and fervour.

Wishing all of you a very smooth and successful crushing season 2022-23.

(Narendra Mohan)
Director

OUR PROVISIONS

SHARKARA SHRI AWARD DISTRIBUTION:

"SHARKARSHRI" award conferred to 15 distinguished alumni of the institute by Sadhvi Niranjan Jyoti, Hon'ble Minister of State, Ministry of Consumer Affairs, Food & Public Distribution & Rural Development during the programme organized on 23rd July 2022, at the institute under aegis of "Old Boy's Association". The awards were given for their long and exemplary service to sugar and alcohol industry. Prof. Samser, Vice Chancellor, HBTU also graced the occasion.

Sadhvi Niranjan Jyoti, Minister of State, Ministry of Consumer Affairs, Food & Public Distribution and Rural Development, Government of India lauded the efforts being made by the institute to make its presence felt globally. Presence of students of this institute in the country and in many sugar producing countries at superior positions is itself an indicator of the quality. Such awards shall encourage and boost the morale of technical people working in sugar and allied industry. I hope the alumni of this institute shall continue their relation with it and contribute to expand its activities many folds, she said.



SHARKARSHRI AWARDEE-

Shri Sanjay Awasthi did his Post Graduate studies in Sugar Technology in 1990 and then also completed his Fellowship of National Sugar Institute, Kanpur in Sugar Technology. Presently, he is the Business Head of ISGEC Heavy Engineering Ltd and also the President, STAI. He has received several medals viz. Noel Deerr Gold Medal, DSTA Gold Medal etc.

Shri K.P. Singh did his Post-graduation in Industrial Fermentation & Alcohol Technology (DIFAT) from National Sugar Institute, Kanpur in 1972. He is one of the most versatile Alochol Technologist of the country. At present, he is working as a Director (Operations) at Radico Khaitan Ltd.

Shri Neeraj Bansal did his certification in Sugar Engineering from National Sugar Institute, Kanpur in 1991. Presently, he is working as a Chief General Manager, Balrampur Chini Mills Ltd., Unit-Mankapur. He is a council member of STAI, member of UP Cogen Association and Expert Panel for review of BIS standards for Sugar Industry.

Shri Vijendra Singh is an alumni of 1981 batch of Sugar Technology from National Sugar Institute. He is a Sugar Technologist par excellence and management expert of proven ability. After working with many renowed sugar groups of the country, he is currently serving as an Executive Director & Dy. CEO, Shree Renuka Sugars.

Dr. (Mrs.) Pratibha Misra did her Ph.D in Applied Chemistry in December 2007, for which she worked as a research scholar in Biochemistry Division of National Sugar Institute, Kanpur. She was also awarded silver medal during the 70th annual convention of The Sugar Technologists Association of India (STAI) by Hon'ble Dr. A.P.J. Abdul Kalam.

Shri Ashok Kumar Nanda did his Post Graduate studies in Sugar Technology from National Sugar Institute in 1975 and also did his Fellowship in Sugar Technology thereafter. Presently he is working as President (Sugar), Spray Engineering Devices Ltd. Shri Ashok Kumar Nanda has won various medals, awards and laurels in his field.

Shri E. Muthuvelappan completed his Post Graduate studies in Sugar Technology from National Sugar Institute in 1989 with honours obtaining Gold Medal. At present he is working as Chief Sugar Chemist in Tamil Nadu Sugar Corporation. He has also won many medals for his papers in various publications.

Shri Shyam Sunder Singh did his Post Graduate studies in Industrial Fermentation and Alcohol Technology from National Sugar Institute, Kanpur in 1991. At present, he is working as Unit Head at Wave Distilleries & Breweries Ltd. (Aligarh).

Shri Dattaram Maruti Raskar did his Associateship Sugar Technology from National Sugar Institute, Kanpur in 1982. At present he is working as a Chief Executive Officer at Shreenath Mhaskoba Sakhar Karkhana Ltd. He has written and presented 25 research papers on various topics and has also received many awards.

Shri P.S. Srivastava completed his Sugar Engineering in 1973 from National Sugar Institute, Kanpur. He is a competent engineer with aptitude for developing innovative technologies. After serving sugar industry for many years, he turned as an entrepreneur and manages a company "Enmill Technologies".

Shri Sunil Kumar Ohri completed his Post Graduate studies in Sugar Technology from National Sugar Institute, Kanpur in 1985. At present, he is working as a General Manager in U.P Co-operative Sugar Factories Federation Ltd. He has played key role in setting up of new and modernization of old cooperative factories.

Shri Alok Saxena did his Post Graduate Diploma in Sugar Technology from National Sugar Institute, Kanpur in 1984. He was topper of his batch and was the recipient of Mahatma Gandhi Gold Medal. Presently he is working in Gobind Sugar Mills, Aira (GSM) as an Executive Director.

Shri Vinay Kumar did his Associateship of National Sugar Institute in Sugar Engineering in 1969 from National Sugar Institute, Kanpur. At present he is working as Independent Consultant. As a representative of the Indian Sugar Industry, he has been participating in almost all the international events, conferences, workshops etc.

Shri V.K. Perumal did his Associateship in Sugar Engineering from National Sugar Institute, Kanpur in the year 1989. Shri V. Perumal exhibited exemplary competency in executing various expansion, modernization and commissioning of new sugar projects in India and abroad. He is working as independent consultant, at present.

Shri Kunchay Jagadeesh did Associateship in Sugar Technology from National Sugar Institute in 1993. While working on the post of Assistant Professor of Sugar Technology took voluntary retirement from government services in 2013. He is presently working as an Advisor (Lab & Quality) at Balrampur Chini Mills Ltd. Development of some formulas to calculate loss of sugar while producing ethanol.

ACCREDITED TRAINING PROGRAMME FOR NIGERIAN SUGAR CO.

Six weeks **"Accredited Training Programme"** for the technical staff of M/s Sunti Golden Sugar Estate, Nigeria was conducted by the institut. More than 30 engineers, technologists and other technical staff participated in the course on virtual mode. The Nigerian participants were imparted knowledge about latest machine and equipment used during processing for reducing steam, power and chemical consumption. Idea was also given to them about recent trends in utilization of by products for producing value added products.

EXECUTIVE DEVELOPMENT PROGRAMME:

Secretary (Food & Public Distribution), Government of India, Shri Sudhanshu Pandey, inaugurated **"Executive Development Programme"** organized from 23rd to 25th August 2022 by National Sugar Institute, Kanpur. He called upon delegates for adopting best practices for improving farm and factory productivities to reduce cost of production and improve viability. Joint Secretary (Sugar) Government of India, Shri Subhodh Kumar Singh also addressed and stressed upon converting so called **"Waste to Resource"** and for utilization of by products in a better manner. Lectures on variety of topics viz. project management, financial management, supply chain management, value addition, modelling of sugar industry and environmental issues were delivered by the institute faculty and other eminent experts from other organizations.

EXPERT LECTURES ORGANIZED:

Expert lectures for the benefit of students of Sugar Technology (ANSI-ST), Sugar Engineering (ANSI-SE), Diploma in Quality Control and Environment Science (DQCES) and Alcohol Technology (DIFAT) were delivered by Shri G.B. Yadav, General Manager (Production), M/s Dalmia Bharat Sugars Ltd, Shri Shivesh Singh, General Manager (Corporate-Technical), M/s Balrampur Chini Mills Ltd., Shri Govind Mishra, Consultant (Alcohol Technology), Shri Shanti Kumar Pandey, Renowned Sugar Technologist, Shri H.S Shukla, Vice President, Radico Khaitan Ltd. and Shri PP Mishra, Advisor, M/s Dhampur Bio-organics Ltd. on the various technical topics during the period.

MEETING OF EXPERT COMMITTEE TO FINALIZED THE SUGAR STANDARDS:

Meeting of the **"Expert Committee for Sugar Standards"** constituted by the Bureau of Indian Standards, Ministry of Consumer Affairs, Food & Public Distribution (Government of India) was held on 23rd September 2022, at the National Sugar Institute under the Chairmanship of Shri Narendra Mohan, Director, NSI, Kanpur.

The Expert Committee finalized the sugar standards for the sugar season 2022-23 commencing from 1st October 2022. The meeting was attended by representatives from the Ministry of Consumer Affairs, Food & Public Distribution, Indian Sugar Mills Association, The Sugar Technologists Association of India and the Bureau of Sugar Standards etc.

The committee also decided to introduce new standard in 32 colour series keeping in view the improvement in quality of sugar in the country over the years. NSI, Kanpur collected hundreds of sugar samples from various states and the analysis indicates necessity of introducing new grade for

superior quality sugar, said Shri Narendra Mohan, Director, National Sugar Institute. This will help both the producers and buyers, particularly, the industrial users of sugar who procure about 65% of the total sugar which is consumed and aspire for very good sugar quality..


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RESEARCH WORK:

1. **Studies on isolation of Lignin from sugar industry-based biomass and development of the process for the conversion of derived lignin and fermentable sugar to value-added product -** The experimental work related to purifying the vanillin from crude reaction mixture have been performed. Few attempts towards crystalizing vanillin from crude reaction mixture were tried by selecting different sets of solvents and some more trials are ongoing.

2. **Studies on production of chloromethyl furfural from bagasse derived cellulose in biorefinery approach-** The scale up study to produce chloromethyl furfural on 20 g scale has been planned and preparation of bagasse derived starting material has been carried out and derivation of chloromethyl furfural is under process.

3. **Studies on Sweet Sorghum Bagasse value addition –** In order to find out the mass balance through validating the process, starting material (as available) has been prepared towards executing the experiments in pressure reactor. Separation of hemi cellulose is under way. Efforts are being made to assess the potential of producing various value added products from the Sweet Sorghum bagasse so as to enable higher revenues from the entire Sweet Sorghum chain.

4. **Studies on utilization of molasses for synthesis of 5-alkoxymethylfurfural ethers as promising biofuel candidates -** The one experiment related to synthesis of methyl levulinate from molasses towards improving the yield has been conducted. TLC monitoring study indicated side product formation due to charring of starting material. Further studies to avoid such formation of side product is ongoing.

5. **Comparative study of Five varieties of sweet sorghum for production of ethanol yield –** Sowing of five sweet sorghum varieties, namely, Phule Vasundhra, CSH 22SS, SSV 84, SSV 74 and ICSSH-28 was taken up during the period. Irrigation and weeding practices were taken up during the month of September 2022 and the crop will harvested in last week of December 2022 & then trials shall be conducted to assess ethanol production. The studies have been taken up in collaboration with ICAR-Indian Institute of Millets Research, Hyderabad.

6. **Cane juice syrup study for self-life and production of alcohol -** Two syrup samples were preserved in Bio-Chemistry division at room temperature, one collected from M/s Dalmia

Bharat Sugar & Ind. Ltd., Jawaharpur unit and other from Experimental Sugar Factory of the Institute. Initially syrup collected from Jawaharpur unit was having pH-6.2, Brix around 72, and TRS 64.5 %. Another sample collected from Experimental Sugar Factory, NSI Kanpur was initially having pH-7.0, Brix around 75, and TRS 56.9%. Every month samples were analysed but no appreciable deterioration without addition of any enzyme could be observed till seven months and about one unit drop was seen only in Jawaharpur sample after 10 months. From the experiment, it was observed that storing syrup may not deteriorate at a faster rate if the pH is kept above neutral and brix is raised to 75 + before storage. More studies shall be taken up during the forthcoming crushing season to further validate the data.

7. **Comparative study on polarization by using lead, non-lead, non-lead clarificants and NIR polarimetry –** To facilitate non-lead polarimetry, comparative study was done on polarization of sugarcane juice at 589 nm by applying different doses of Carrez reagent i.e. 0.1ml, 0.2 ml, & 0.5 ml and also by application of lead sub acetate to the sugar cane Juice samples in conventional manner. Appreciable difference in pol reading was observed at higher doses (0.5 ml) of Carrez reagent. Further trials of Carrez reagent and non lead clarificants to be done in different sugar house intermediates. Studies shall also be taken up to polarize the sugar samples in NIR region i.e. at 880 nm and the results shall be compared with the conventional process.

8. **Study of B Heavy molasses for different parameter which is required to be used as edible molasses -** 03 nos. samples of B Heavy molasses received from Double Sulphitation plants were analysed for the parameters of Brix%, Pol%, Purity, RS%, & TRS% and their detailed study for microbial contamination is underway. More samples to be analysed after commencement of new season. The studies undertaken so far indicate possibilities of use of such molasses for direct consumption after some treatment. The molasses was found to be rich in calcium, iron and magnesium content.

9. **Use of Guljag Crystasulf for sugar cane juice clarification -** Two sets of experiments were conducted in which different doses of CRYSTASULF i.e. @ 500 ppm & 1000 ppm were applied to the raw juice after heating to 70 deg.C, and juice was neutralized by addition of milk of lime. Then juice was subjected for heating up to 101-102 deg.C and flocculent @ 1 ppm was also applied for faster settling of juice. Analysis of juice before & after treatment was carried out for pH, Brix%, Pol%, Pty, R.S.% etc. Due to low purity of raw juice, results were not conclusive and further studies are ongoing.

10. **Preservation of syrup and B-heavy molasses storage by the use of different chemicals -** 04 nos. of B Heavy molasses samples were collected from various commercial sugar factories to set up the new sets for further study on deterioration of B Heavy molasses during storage. As per discussions held with the collaborating technology providers, two sets of B Heavy molasses were kept in an open atmosphere i.e. under the similar storage conditions as is carried out in commercial sugar factories. However, in the samples stored in steel tanks in the laboratory, no appreciable changes were observed during the analysis of old B Heavy samples with or without treatment.

RESEARCH PAPER:

1. A research paper entitled **"An overview of B-heavy molasses diversion for boosting ethanol production"** by Narendra Mohan, Ananthalakshmi Ranganathan & Vivek Pratap Singh was presented in the Annual Convention - 2022 of The South Indian Sugarcane & Sugar Technologists' Association (SISTA).

2. A research paper entitled **"Production of Activated Bio-Char from sugar cane bagasse and its application in de-colourising sugar melt"** by Narendra Mohan, Sudhanshu Mohan & Shalini Kumari has been published in International Journal of Science and Research (IJSR), ISSN:2319-7064, SJIF (2022): 7.942.

3. A research paper entitled **"Use of exergy of condensing steam"** by Sanjay Chauhan and D. Swain was presented in the convention - 2022 of The South Indian Sugarcane & Sugar Technologists' Association (SISTA).

4. A research paper entitled **"Indian Sugar Industry: Atmanirbhar Sugar – Ethanol Model"** by Narendra Mohan and Anoop Kumar Kanaujia was presented in the 67th Annual Convention -2022 of the Deccan Sugar Technologist's Association (DSTA).
5. A research paper entitled **"Analysis of Harmonics due to Electrical Drives at Milling Tandem"** by Vinay Kumar and D. Swain, was presented in the Annual Convention-2022 of The Deccan Sugar Technologists' Association (DSTA).

6. A paper entitled **"Comparative Study of Different Sugar Beet Varieties and Their Economic Sustainability for Ethanol Production in India"** by Dr. Seema Paroha, D Swain & Dr. Ashok Kumar, sent to 7th IAPSIT International Sugar Conference & Sugar Tech Expo /Suagarcon-2022 being organized at the Indian Institute of Sugarcane Research, Lucknow.

7. A paper entitled **"Myths about sugar consumption: facts & way forward"** by Narendra Mohan sent to 7th IAPSIT International Sugar Conference & Sugar Tech Expo/ Suagarcon-2022 being organized at the Indian Institute of Sugarcane Research, Lucknow.

8. A paper entitled **"Advent of artificial sweeteners- is it a threat to sugar consumption?"** by Sneha Agarwal & Narendra Mohan published in **"SHARKARA"** (July – September 2022), VOLUME: 54, NO. 02, ISBN: 978-93-5445-372-4.

9. A paper entitled **"Sugar Dust Explosion – Occurrence, Remedies and Prevention"** by Sanjay Chauhan & D Swain sent to 7th IAPSIT International Sugar Conference & Sugar Tech Expo/ Suagarcon-2022 being organized at the Indian Institute of Sugarcane Research, Lucknow, India.

10. A paper entitled **"Vanillin synthesis from sugarcane bagasse lignin in a bio-refinery concept"** sent to 7th IAPSIT International Sugar Conference & Sugar Tech Expo/ Suagarcon-2022 being organized at the Indian Institute of Sugarcane Research, Lucknow, India.

SALE OF SUGAR STANDARDS:

Sale of sugar standard grades commenced from 1st October 2021 for the sugar season 2021-22. Standard grades can be procured online also. Institute sold 1081 sugar standard to the 229 sugar factories up to September 2022. For procurement of sugar standards for the sugar season 2022-23, the details are available on institute website *http://www.nsi.gov.in*

OUR ADVISORY:

Besides conducting teaching and training programmes, carrying out research in relevant field, another main functions of the institute are:

1. To function as a **"Think-tank"** to sugar and allied industry for proposing modernization and trouble free functioning of the process on advisory basis / through Extension Services.
2. To formulate strategies and promotes measures for expansion of capacities, energy conservation, co-product utilization etc. for sugar and allied industries.
3. To assist Govt. of India through technical contribution in policy formulation and control of Sugar Industry.
4. To render assistance to various government organizations in implementation of policies, validations and on associated matters.
5. To extend human resource management services to various government and private organizations.

CONSULTANCY:

Request for consultancy services of the institute were received and as also provided to various sugar factories and ethanol units on various technical matters relating to diversion of B Heavy molasses/syrup, validation of ETP's, preparation of DPR's, validation of no increase in pollution loads in ethanol units upon enhancement in capacity etc.

1	*Dhampur Bio Organics Unit – Asmoli, Sambhal, U.P.*
2	*Fullon Sugar Pvt. Ltd., Andheri East, Mumbai, M.H.*
3	*Dalmia Bharat Sugar & Ind. Ltd., Unit – Jawaharpur, Sitapur, U.P.*
4	*Bajaj Hindusthan Sugar Ltd., Unit – Rudhauli, Basti, U.P.*
5	*The Kisan Sahkari Chini Mills Ltd., Mahmudabad, Sitapur, U.P.*
6	*Sahakar Maharshi Shankarrao Kolhe Sahakari Sakhar Karkhana Ltd., M.H.*

7	*The Kisan Sahkari Chini Mills Ltd., Badaun, U.P.*
8	*SBEC Sugar Ltd., Malakpur, Bagpat, U.P.*
9	*Kisan Sahkari Chini Mills Ltd., Nanauta, Saharanpur, U.P.*
10	*Balrampur Chini Mills Ltd., Balrampur, U.P.*
11	*Parle Biscuits Pvt. Ltd., Bahraich, U.P.*
12	*The Kisan Sahkari Chini Mills Ltd., Kaimganj, Farrukhabad, U.P.*
13	*Maa Mahamaya Sahkari Shakkar Karkhana Maryadit, Ambikapur, Chhattisgarh*
14	*Simbhaoli Sugar Mills Ltd., Unit – Simbhaoli, Ghaziabad, U.P.*
15	*Kesar Enterprises Ltd., Unit – Baheri, Bareilly, U.P.*
16	*Dalmia Bharat Sugar & Industries Ltd., Distillery Unit – Ramgarh, Sitapur, U.P.*
17	*Dalmia Bharat Sugar & Industries Ltd., Sugar Unit – Ramgarh, Sitapur, U.P.*
18	*Dhampur Sugar Mills Ltd., Chemical Division Dhampur, Bijnor, U.P.*
19	*Dalmia Bharat Sugar & Industries Ltd., Distillery Unit – Nigohi, Shahjahanpur, U.P.*
20	*Bajaj Hindusthan Sugar Ltd., Unit – Khambarkhera, Lakhimpur Kheri, U.P.*
21	*Daurala Sugar Works, Unit – Daurala, Meerut, U.P.*
22	*Magadh Sugar & Energy Ltd., Unit – New Swadeshi Sugar, Narkatiaganj, Bihar*

ANALYTICAL SERVICES:

Besides analysis of sugar & sugar house products, Ethanol and effluents etc. Institute started offering testing of Ethyl Alcohol based Sanitizer in its sophisticated, most modern NABL & BIS accredited analytical laboratory and other laboratories of the institute. Testing of bagasse for determination of GCV also taken up during the period. Analytical services were rendered to following:

1	*Dalmia Bharat Sugar & Ind. Ltd., Unit – Nigohi, Shahjahanpur, U.P.*
2	*Magadh Sugar and Energy Ltd., (Unit - Bharat sugar Mills), Gopalganj, Bihar*
3	*UP State Corporation, Mohiuddin, Meerut, U.P.*
4	*Wave Sugar Ltd., Unit – Bijnor, U.P.*

5	*Wave Sugar Ltd., Unit – Dhanaura, U.P*
6	*Govind Sugar Mills Ltd., Unit – Aira, Shahjahanpur, U.P.*
7	*Kisan Sahkari Chini Mills Ltd., Najibabad, Bijnor, U.P.*
8	*Kisan Sahkari Chini Mills Ltd., Tilhar, Shahjahanpur, U.P.*
9	*KSC Mills., Anoopsahar, Bulandsahar, U.P.*
10	*Lords Distillery, Sadiyabad, Gazipur, U.P.*
11	*Triveni Engineering Ind. Ltd. Unit – Deoband, Saharanpur, U.P.*
12	*Magadh Sugars & Energy Ltd., (Bharat Sugar Mills Sidhwalia), Gopalganj, Bihar*
13	*Rana Sugars Ltd., Belwara, Muradabad, U.P.*
14	*PBS Food (Sugar) Pvt. Ltd., Chandanpur, U.P.*
15	*Govind Sugar Mills Ltd., Unit – Aira, Lakhimpur Kheri, U.P.*
16	*Avadh Sugar & Energy Ltd., Unit – Seohara, Bijnor, U.P.*
17	*Dalmia Bharat Sugar & Industries Ltd., Unit – Jawaharpur, Sitapur, U.P.*
18	*Triveni Engineering & Ind. Ltd., Unit – Sabitgarh, Bulandshahr, U.P.*
19	*Rasi Nutr Foods India Pvt. Ltd., Bhavani taluk, Tamilnadu*
20	*Kisan Sahkari Chini Mills Ltd., Unit – Kaimganj, Farrukhabad, U.P.*
21	*The Kisan Sahkari Chini Mills Ltd., Unit – Sathiaon, Azamgarh, U.P.*
22	*Maa Mahamaya Sahkari Shakahar Karkhana, Jagarnathpur, Chhattisgarh*

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OUR OTHER ACTIVITIES:

1. Orientation Programme was organized for the new students admitted during academic session 2022-23 at National Sugar Institute, Kanpur on 24th August 2022. Director, Education In-charge, Controller of Examination & Hostel Wardens addressed and briefed the students about hostels rules, academic calendar and discipline to be followed.



2. Director, NSI, Kanpur along with other experts of the institute visited the M/s Sahakar Maharshi Shankarrao Kolhe SSK Ltd., Kopargaon, Ahmednagar on 9th July 2022 and advised them on the production of value-added products from sugar cane bagasse and on the production of specialty sugars.


3. National Sugar Institute, Kanpur got patent for developing "**Non –Ionic Surfactant from Sugarcane Bagasse"**. The surfactant having good surface activity and bio-degradable properties has applications in personal care products, cosmetics and in production of soaps and detergents.


4. National Sugar Institute, Kanpur conducted an online meeting on 16th July 2022, to help Kenya in training manpower to serve the Kenyan Sugar Industry. Matter discussed between officials of National Sugar Institute, Kanpur and Great Lakes University, Kenya. Prof. Hazel Miseda Mumbo, Vice Chancellor, Great Lakes University sought NSI assistance for conducting training programmes for the purpose.

5. Director, National Sugar Institute, Kanpur addressed Business Meet organized by Cogeneration Association of India at Lucknow on the topic **"Sugar Factories- The Future Innovative Energy Hub"** on 16th July 2022 and suggested various models for boosting ethanol, power and Compressed Biogas production. He called upon the delegates to explore potential of utilization of "Sugarcane Plant Residues" for generation of power. Press Mud or Filter Cake is another by-prouduct, the potential of which for production of CBG has not been harnessed, he said.

6. National Sugar Institute, Kanpur and ICAR-Central Tuber Crop Research Institute, Thiruvananthapuram agreed in principle to work together for production of ethanol from Cassava. Director's and experts from the two institutes had discussions on the matter through video conferencing.

7. Director, National Sugar Institute, Kanpur addressed **"Stakeholders Meet on Sugarcane & Sugar Sector @2025"** on the topic **"Sugarcane- Harnessing the Unexploited Potential"** at Indian Institute of Sugarcane Research (IISR) Lucknow on 20th July 2022.

8. Director, NSI Kanpur, visited to Sugarcane Breeding Research Institute, Coimbatore and discussed issues related to productivity of sugarcane in Tamil Nadu and South Karnataka. Also discussed the need for newer variety as replacement for Co238 in Northern India and on future of transgenic and energy sugarcane.

9. Director, National Sugar Institute, Kanpur, conferred **"Noel Deerr Gold Medal"** by Shri Sudhanshu Pandey, Secretary (Food & Public Distribution) for paper on development of innovative technology for purification of sugar factory condensate for their reuse in place of fresh water during The 80th Annual Convention of The Sugar Technologists' Association of India (STAI) held on 28th – 29th July 2022 at Dr. Shyama Prasad Mukherjee Indoor Stadium, Goa.

10. "**World Biofuel Day"** was celebrated at National Sugar Institute, Kanpur on 10th August 2022. Various technical aspects like bio-energy, bio-ethanol, bio-electricity, CBG and Green Hydrogen from sugar industry discussed in length. Prof. D. Swain stressed upon reducing dependence on fossil fuels as they are not forever and also to minimize carbon and green house gases emissions. Greenhouse gases trap heat and make the planet warmer. Dr.(Mrs.) Seema Paroha, Professor Biochemistry in her introductory briefed the students about aim of organizing this day.

In his address, Shri Narendra Mohan, Director, National Sugar Institute highlighting the key role played by the sugar industry to make ethanol blending programme a success said, "Indian Sugar Industry is all set to play a dominant role in Ethanol Blending Programme. Ethanol, which is now a favorite tool to balance sugar demand-supply scenario has to be preferred for its multiple advantages of saving foreign exchange, energy security and having a green fuel.


11. आज़ादी के अमृत महोत्सव के तत्वाधान मे **स्वतंत्रता दिवस** की पूर्व संध्या पर राष्ट्रीय शर्करा संस्थान, कानपुर मे शिक्षकों, अधिकारीयों एवं छात्रों द्वारा तिरंगा यात्रा निकाली गयी। छात्रों द्वारा **"भारत माता की जय" एवं "वन्दे मातरम्"** के गगन भेदी नारों ने सबमे जोश भर दिया।


12. **राष्ट्रीय शर्करा संस्थान, कानपुर मे स्वतंत्रता दिवस पूरे उत्साह के साथ मनाया गया। संस्थान द्वारा "स्वच्छता मिशन" के अंतर्गत लगन से कार्य करने वाले सफाई कर्मियों को पुरुस्कृत किया गया। साथ ही शर्करा प्रौद्योगिकी विभाग को "सबसे स्वच्छ विभाग " होने की "स्वछता ट्रॉफी " प्रदान की गयी।**

एक सांस्कृतिक कार्यक्रम का भी आयोजन किया गया जिसमे डॉ शालिनी वेद त्रिपाठी, सुश्री अलका मिश्रा, मुकेश श्रीवास्तव ने अपनी कविताओं से संस्थान कर्मियों एवं छात्रों मे जोश भर दिया।


13. Shri Narendra Mohan, Director, National Sugar Institute, Kanpur was conferred **"Excellence Award"** for his exemplary contribution in Ethanol Blending Programme, for converting sugar factories into hub of bio-energy and other value added products which has benefitted both, the millers and the farmers. The award was given to him by Mr. Parshottam Rupala, Union Cabinet Minister of Fisheries, Animal Husbandry and Dairying & Mr. Kailash Choudhary, Union Minister of State for Agriculture and Farmer Welfare, Govt. of India at New Delhi.

He also addressed delegates on the topic of **"The Energetic Indian Sugar Industry"** on this occasion.

14. National Sugar Institute, Kanpur and ICAR-Indian Institute of Maize Research, Ludhiana to work jointly to assess the potential of ethanol production from different maize varieties. Director, ICAR-Indian Institute of Maize Research, Ludhiana, visited NSI, Kanpur to discuss & take the matter forward. It was decided to sign a MoU between the two organizations for taking the matter forward and to honour timelines as well.


15. Director National Sugar Institute, Kanpur, visited ICAR-Indian Institute of Millets Research, Hyderabad. Future planning with timelines discussed for promoting production of bio-ethanol from **"Sweet Sorghum".** Details of trials conducted at the institute were also discussed.


16. Director National Sugar Institute, Kanpur, and Shri Vinay Kumar were conferred **"JP Mukharji Gold Medal"** for the best paper "**Electric Drives for Cane Preparation- A Critical Review of Conventional System and Recent Developments"** in the Engineering Section during the 51th Annual Convention of SISSTA at Tirupati.


17. Director National Sugar Institute, Kanpur was conferred "**National Cogeneration Award"** by Shri Nitin Gadkariji, Hon'ble Minister of Road Transport & Highways, Government of India for contribution for converting sugar factories into **"Hub of Bio-energy"** in the presence of Shri Sharad Pawarji, Hon'ble Member of Parliament.

18. National Sugar Institute, Kanpur developed cheaper technology for producing **"Solid Alcohol"**. This will enable the use of solid form of alcohol in place of petroleum products, viz. **"paraffin"** in the occasions viz. catering trade, tourism and field work for heating and warming purposes.


19. राष्ट्रीय शर्करा संस्थान में **"शिक्षक दिवस"** समारोह, छात्रों की क्रिया-कलाप परिषद द्वारा आयोजित किया गया। समारोह में संस्थान के छात्रों की वैज्ञानिक समिति के उपाध्यक्ष ने संस्थान के शिक्षकों के प्रति अपना आभार व्यक्त करते हुए उनसे जीवनपर्यंत पथ-प्रदर्शक की भूमिका का निर्वहन करने का अनुरोध किया। छात्रों की क्रिया-कलाप परिषद द्वारा इस अवसर पर जहाँ संस्थान के वरिष्ठ शिक्षकों का सम्मान किया गया वहीं छात्र और शिक्षकों के बीच में बेहतर समन्वय स्थापित करने हेतु कई प्रतियोगितायें भी आयोजित की गयीं।


20. National Sugar Institute, Kanpur was conferred **"Bharatiya Sugar- Overall Outstanding Performance- Institute of the Year Award"** at Pune on 8th September 2022. The award was received by Director, National Sugar Institute, Kanpur wherein alumni of the institute were also present in large nos. While expressing his thanks to the institute staff, he complimented the industry also for consistent support and many accomplishments.

21. For the new coming students of National Sugar Institute, a fresher's party **"FRESHO - 2022"** was organized on 11th September 2022, by the senior students of the institute. The programme was inaugurated by lighting the lamp by Shri Narendra Mohan, Director of the institute.


22. Students of B.Tech. & M. Tech. (Food Technology) courses of Integral University, Lucknow visited National Sugar Institute, Kanpur on 14th September 2022, to know about recent trends in sugarcane farming, processing and production of value-added products from by-products using innovative technologies.


23. Operation of **"Micro Brewery"** commenced on 16th September 2022, at National Sugar Institute, Kanpur. A 200 liter/day capacity brewery was operated during every academic session to impart practical knowledge to the students of Industrial Fermentation & Alcohol Technology Course viz. about design feature of plant & machinery and process parameters.


24. संस्थान मे **"विश्वकर्मा जयंती"** दिनांक १७ सितम्बर २०२२ को संस्थान के यन्त्र एवं प्रायोगिक शर्करा प्रयोगशाला मे मनाई गयी। संस्थान के निदेशक एवं अन्य कर्मियों और छात्र-छात्राओं ने इस अवसर हवन एवं भगवान् विश्वकर्मा की आरती समारोह मे भाग लिया।


25. Shri Narendra Mohan, Director, National Sugar Institute, Kanpur received First Prize for the paper on **"Bio-ethanol from sugar industry- the tool for survival"** during the 67th Annual Convention of DSTA on 18th September 2022, at Pune, in the presence of Shri Sharad Pawarji and Sugar Commissioner (Maharashtra). Director, National Sugar Institute, Kanpur also address to the delegates wherein focused on **"Sugar Industry @2047".**

26. Director, National Sugar Institute, Kanpur addressed **"Green Sugar Summit"** organized by Confederation of Indian Industry (CII) on 19th Sept. 2022, at New Delhi. He Discussed from clean and green processing to clean and green energy. He called upon the sugar industry personnel to develop various business models of producing sugar & green energy as per requirement and relative economics.

27. Operation of **"Nano Grain Based Ethanol Unit"** commenced at National Sugar Institute, Kanpur on 20th September 2022. The unit has been integrated with existing **"Molasses Based Ethanol**

Unit", so now the unit can produce ethanol from juice, syrup and molasses or from grains viz. rice and maize etc.


With the development of such facility, National Sugar Institute, Kanpur has now become the only sugar institute across the globe to have such advance facility for effective training, said Shri Narendra Mohan, Director, National Sugar Institute. The students shall develop better understanding of unit operations and process parameters to be maintained to achieve highest possible productivity, he said.

28. During the month of September **"Annual Sports -2022"** were organized at National Sugar Institute, Kanpur. Inauguration of the meet was made by Shri Narendra Mohan, Director at the Gymnasium of the institute.

29. Campus Interviews during the period conducted by M/s Mawana Sugars Ltd., M/s Balrampur Chini Mills Ltd., M/s DCM Shriram Ltd. (Sugar Division), M/s Wave Sugar Industries Ltd, M/s Renuka Sugars Ltd., M/s NSL Sugars Ltd. and M/s Uttam Sugar Mills Ltd for recruitment of Sugar Technologists, Alcohol Technologists and Sugar Engineers etc. In the first phase of recruitment more than 150 students of various courses were selected.


30. Meeting of **"Sugar Industry Sectional Committee"** under Bureau of Indian Standards held under the Chairmanship of Director, National Sugar Institute, Kanpur on 23rd Sept. 2022. Specifications for several special sugars viz. low sulphur sugar, light brown and dark brown sugar were finalized on behalf of BIS.

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HAPPENING IN THE SUGAR INDUSTRY:

Cabinet Hikes Cane FRP to ₹305/quintal-

The Cabinet Committee on Economic Affairs has fixed the fair and remunerative price (FRP) of sugarcane the minimum price that sugar mills must offer farmers at ₹305/quintal for the next marketing season 2022-23. FRP is fixed to ensure a guaranteed price to sugarcane growers. The FRP of ₹305 has been fixed for a basic recovery rate of 10.25%, which is the amount of sugar produced by crushing a given amount of sugarcane by weight. The government has also made a provision for a reduction in FRP by ₹3.05 per quintal for every 0.1 percentage point decrease in recovery. However, there shall not be any deduction in the case of sugar mills where recovery is below 9.5%. Such farmers will get ₹282.125 per quintal for sugarcane in the ensuing sugar season 2022-23 in place of ₹275. 50 per quintal in the current season.

Sugar mills object to Centre's move to raise domestic sales quota for Septmber-

Sugar millers have objected to the higher than expected sugar sales quota for the month of September 2022 on the grounds that selling more sugar in the domestic market will suppress the already weak prices and impact their realisation. In India, the Central government determines the quantity of sugar that each mill can sell in the domestic market each month which keeps on changing depending upon the demand-supply matrix. The millers said that Centre has fixed a sales quota of 2.35 million tonnes for the month of September which is higher than the average sales quota of 2.2 million tonnes in the past few months and also more than the quota that it has fixed for September in the past years.

"Indian Ethanol Scenario" in talks with Expert Abinash Verma-

He said, "With the Hon'ble Prime Minister, Narendra Modi ji, personally overseeing and encouraging the ethanol blending programme (EBP) in the country, there are several positives for the sector. The Government has correctly attempted to first develop adequate ethanol production capacity, for which financial incentives in the form of interest subvention for 5 years, attractive ethanol prices linked to the feedstock and concessions in bank loans have been introduced in the last 5 years or so. Seeing a big opportunity for its farmers, most of the State Governments have also very swiftly announced their own ethanol policies with several incentives therein. The result has been massive excitement amongst investors, including new entrepreneurs, both in the sugar/sugarcane based and grain based ethanol plants. The available data gives us the confidence that ethanol production capacity will be adequate by 2025 to produce more than 10 billion litres of ethanol for the required blending level of 20% across the country, as targeted by the Hon'ble Prime Minister."

India's ethanol production capacity jumps to 923 cr litres p.a.-

Diversion of excess feedstock diversion for ethanol production has led to a jump in production capacity to 923 crore liters per annum, the ministry of consumer affairs, food & public distribution said on Sunday. The ministry of consumer affairs, food & public distribution said that low carbon innovative technologies are helping India progress towards Net Zero goals assisting in obtaining

COP26 goals for the country while facilitating Atmanirbhar Bharat Abhiyaan by meeting 20% petrol requirements from ethanol and strengthening energy security of the country.

Sugarcane crushing delayed in UP-

Uttar Pradesh, India's No 1 sugarcane producer, may see a drop in yield and recovery rate in central and eastern regions after heavy rains affected the crops in many places leading to severe waterlogging in the field. However, the extent of damage can be assessed only after rains completely stop, said industry officials and experts. "The estimate in the current season (October-September) was 12.05 million tonnes (mt) of sugar (including the quantity to be diverted for ethanol), but recent rains have changed the situation and though there will be a drop, it is too early to estimate now since rain is still continuing," said an industry official.

Indian Sugar Mills Association appoints Shri Sonjoy Mohanty as new Director General-

ISMA's main Committee in its meeting held, has decided to appoint Shri Sonjoy Mohanty as the new Director General of ISMA. He will assume the office before 15th October 2022. Mr. Mohonty has done his MBA from IIM, MA in Business Economics from Delhi University. He was Secretary General at International Spirits and Wines Association of India. He has over 35 years of work experience in corporations across Oil & Gas, Micro Banking, Healthcare, Telecom and Durables Sectors.

India needs to export 8 million tonnes of sugar in 2022-23: ISMA-

The Indian Sugar Mills Association has urged the government to speed up announcing the sugar export policy for the marketing year 2022-23 as the country is expected to export a surplus of 8 million tonnes of sugar, according to business-standard.com. Vivek Pittie, member of ISMA and the Director, Harinagar Mills, said, "We request the government to adopt either the system that was prevalent in 2020-21 or under the Open General License (OGL) system used in 2021-22 season as both are proven and tested and do not experiment with the new system." Speaking at the event organised by ISMA, he said that India is expected to export 8 million tonnes of sugar for the 2022-23 season.

Prime Minister calls for implementation of ethanol blending-

Prime Minister Narendra Modi has called the states to focus on the implementation of ethanol blending and create roadmap for vehicle scrapping, reports Money Control. He was speaking at the inauguration of the National Conference of the Environment Ministers held on September 23 and 24 in Gujarat. Addressing the meeting he said, "Taking forward the spirit of cooperative federalism, the conference is being convened to create further synergy amongst the central and state governments in formulating better policies on issues such as elimination of plastic pollution through multi-pronged approach, state action plans to effectively combat climate change with focus on LiFE-Lifestyle for Environment."

The revised report suggest a hike in sugar output in Brazil for the 2022/23 season-

Sugarcane crushing in Brazil's centre-south (CS) region is likely to increase this season as against earlier expectations due to more favourable weather conditions and increased focus of millers to produce sugar, as per a report released by consultancy Job Economia on Thursday, according to nasdaq. As per the report, the main sugar belt of the country will crush 566 million tonnes of sugarcane in 2022/23 as against the earlier projection of 558 million tonnes.

Bangladesh govt. cuts prices of packaged and loose sugar-

Acting on the recommendations of the Bangladesh Trade and Tariff Commission (BTTC), the commerce ministry has cut the prices of packaged and loose sugar by Tk6 and Tk8 per kg respectively, according to tbsnews. The notice issued by the ministry stated that the rates will be effective from 25 September. The packaged sugar will be now sold at Tk89 from Tk95 while the loose sugar will be sold at Tk84 from Tk 92. The decision to fix the price of sugar was announced by the Ministry of Commerce on 30 August. However, sugar is sold at a higher rate than the recommendations made by the ministry. It is sold in the range of Tk90 to Tk95 as per the rates in the retail market on Tuesday.

Reduce production of sugar and diversify agriculture towards energy and power sectors: Nitin Gadkari-

Production of sugar is a problem for the economy; we spend Rs. 15 lakh crores / year for import of petroleum products, hence we need to diversify the agriculture sector towards energy and power sectors, said Union Minister for Road Transport and Highways Shri Nitin Gadkari while addressing the felicitation programme of National Cogeneration Awards 2022 in Mumbai on August 27, 2022. The Minister exhorted the industry of the crucial need to focus on alternative fuels with the help of futuristic technologies. "While 65% – 70% of our population depends on agriculture, our agricultural growth rate is 12%-13% only; the sugarcane industry and farmers are a growth engine for our industry. And the next move should be cogeneration to increase revenue from sugar. The industry should produce less sugar and produce more byproducts, embracing the vision for futuristic technologies and using the power of leadership to convert knowledge into wealth." This will enable the farmers to become not only food growers, but energy producers as well, he said.

Achievement of 10 per cent ethanol blending is symbol of Government's resolve towards just energy transitions-

The Ministry of Petroleum and Natural Gas (MoPNG) on Friday signed contracts for 31 Discovered Small Fields (DSF) blocks under DSF bid round-III and four CBM blocks under CBM bid round V awarded to 14 exploration and production domestic companies. Union Minister for Petroleum and Natural Gas Hardeep Singh Puri was present at the event in which he also unveiled the logo for India Energy Week (IEW) 2023, the ministry's flagship event to be held from February 6-8, 2023 in Bengaluru.

फिलीपींस: सीजन के एक महीने पहले चीनी मिलें परिचालन शुरू करेंगी-

फिलीपींस की कुछ मिलों ने चीनी की घरेलू आपूर्ति को बढ़ावा देने के लिए सामान्य से एक महीने पहले सीजन शुरू करने का फैसला किया है। A sociacion de Agricultores de La Carlota y Pontevedra (AALCPI) के महाप्रबंधक डेविड अल्बा ने कहा कि, नेग्रोस ऑक्सिडेंटल में तीन चीनी मिलें आधिकारिक पेराई सीजन शुरू होने से पहले ही अपना परिचालन फिर से शुरू कर देंगी।

चीन की सबसे बड़ी 'कोयले से एथेनॉल' बनाने की परियोजना का ट्रायल शुरू-

500,000 टन के वार्षिक उत्पादन के साथ चीन की सबसे बड़ी कोयला आधारित एथेनॉल परियोजना गुरुवार को उत्तर पश्चिमी चीन के शानक्सी प्रांत के यूलिन शहर में पूरी हो गई और अब ट्रायल शुरू हो गई है। परियोजना में एथेनॉल और अन्य रासायनिक उत्पादों के उत्पादन के लिए कच्चे माल के रूप में कोयले का उपयोग होगा और यह हर साल 1.5 मिलियन टन कोयले को परिवर्तित कर सकती है।विशेषज्ञों ने कहा कि, तीन टन अनाज एक टन एथेनॉल का उत्पादन कर सकता है और परियोजना के पूरा होने और संचालन में आने के बाद हर साल 1.5 मिलियन टन जैव-एथेनॉल कच्चे अनाज को बचा सकता है। यह परियोजना डाइमिथाइल ईथर के कार्बोनिलेशन के माध्यम से एथेनॉल का उत्पादन करती है।

एथेनॉल सम्मिश्रण तेल आयात को काफी हद तक कम कर देगा:-

कर्नाटक के मुख्यमंत्री बसवराज बोम्मई ने कहा कि, वाहन निर्माताओं को आम लोगों के लिए किफायती इलेक्ट्रिक वाहन बनाने पर अधिक ध्यान देना चाहिए। बोम्मई ने शुक्रवार को ईवी अभियान 2022 और 152 ईवी चार्जिंग स्टेशनों का उद्घाटन किया। इस अवसर पर बोलते हुए, मुख्यमंत्री बोम्मई ने कहा कि, राज्य सरकार ने हाइड्रोजन ईंधन के उत्पादन के लिए दो कंपनियों के साथ समझौता ज्ञापन पर हस्ताक्षर किए हैं। हाइड्रोजन को अक्षय ऊर्जा स्रोतों में सर्वश्रेष्ठ के रूप में देखा जाता है। प्रधान मंत्री मोदी ने जीवाश्म ईंधन पर निर्भरता को कम करने की समग्र योजना के हिस्से के रूप में तेल में एथेनॉल मिश्रण को 20 प्रतिशत तक बढ़ा दिया है। उन्होंने दावा किया कि, ये पहल आने वाले वर्षों में हमारे तेल के आयात को काफी हद तक कम कर देगी।

गुड़ इकाइयों का क्लस्टर बनाकर एथेनॉल उत्पादन की अनुमति दी जाए-

किसान नेता और स्वाभिमानी शेतकरी संगठन के अध्यक्ष राजू शेट्टी ने मांग की है कि, राज्य भर के गुड़ इकाइयों का क्लस्टर बनाकर एथेनॉल उत्पादन की अनुमति दी जाए। शेट्टी ने मांग पर चर्चा के लिए कुछ दिन पहले केंद्रीय मंत्री नितिन गडकरी से मुलाकात की थी। उन्होंने दावा किया कि, भारत में उत्पादित लगभग 15% गन्ने का उपयोग गुड़ तैयार करने के लिए किया जाता है। गुड़ बनाना एक पारंपरिक व्यवसाय है और चीनी उत्पादन के विपरीत छोटे पैमाने पर किया जाता है। उन्होंने कहा, फिलहाल सिर्फ चीनी मिलों को ही एथेनॉल का उत्पादन करने की अनुमति है।

चीनी मिलें एथेनॉल उत्पादन को लेकर गंभीर, प्रतिनिधिमंडल का ब्राजील दौरा-

केंद्र सरकार के एथेनॉल समिश्रण निति को बढ़ावा देने के लिए चीनी उद्योग हर मुमकिन प्रयासों में जुटा है। उत्तर प्रदेश की चीनी मिलें भी राजस्व में बढ़ोतरी के साथ साथ समय पर किसानों का भुगतान करने के लिए एथेनॉल उत्पादन में दिलचस्पी दिखा रही है। मुजफ्फरनगर जिले की चीनी मिले भी नए सत्र से एथेनॉल का उत्पादन करने के लिए आगे आई है। अमर उजाला में प्रकाशित खबर के मुताबिक, खाद्य विभाग के संयुक्त निदेशक जितेंद्र जुयाल के नेतृत्व में चीनी मिलों के प्रबंधक, तेल कंपनी, ऑटोमोबाइल कंपनियों के अधिकारियों का एक प्रतिनिधिमंडल हाल ही ब्राजील के दौरे पर गया था।

सीएसआईआर-आईआईपी ने उन्नत गुड़ निर्माण संयंत्र के लिए एक समझौते पर हस्ताक्षर किया-

कृषि और कृषि आधारित कुटीर उद्योग ग्रामीण अर्थव्यवस्था की जीवनरेखा माने जाते हैं, हालांकि, वैज्ञानिक मध्यवर्तन द्वारा ग्रामीण उद्योगों को आधुनिक बनाना ग्रामीण विकास के लिए सबसे बड़ी चुनौती है। सीएसआईआर-आईआईपी का उन्नत गुड़

निर्माण संयंत्र "गुड़ भट्टी" ग्रामीण भारत के कृषि-आधारित कुटीर उद्योग का पुनरुत्थान करने की दिशा में एक महत्वपूर्ण कदम है। यह तकनीक न केवल 'गुड़' निर्माण उत्पादन क्षमता में सुधार ला सकती है, बल्कि उत्सर्जन में भी कमी ला सकती है।

Ethanol Boost- हरित ईंधन से पांच साल बाद भारत में पेट्रोल के इस्तेमाल की जरूरत होगी खत्म: नितिन गडकरी-

भारत ने पेट्रोलियम उत्पाद पर अपनी आयात निर्भरता कम करने के लिए एथेनॉल उत्पादन को बढ़ावा दिया है। 2025 तक देश ने 20 प्रतिशत एथेनॉल सम्मिश्रण का लक्ष्य रखा है, और उसके के लिए केंद्र सरकार द्वारा हर जरूरी कदम उठाया जा रहा है। अब इसी कड़ी को आगे जोड़ते हुए केंद्रीय मंत्री नितिन गडकरी ने भरोसा जताया है कि, हरित ईंधन (Green fuel) से पांच साल बाद देश में वाहनों में पेट्रोल के इस्तेमाल की जरूरत खत्म हो जाएगी।

ईंधन में एथेनॉल का मिश्रण ऊर्जा सुरक्षा के लिए महत्वपूर्ण कदम: केंद्रीय मंत्री-

पेट्रोलियम और प्राकृतिक गैस राज्य मंत्री रामेश्वर तेली ने कहा कि, देश की ऊर्जा सुरक्षा क लिए ईंधन में एथेनॉल मिश्रण को बढ़ाना काफी महत्वपूर्ण कदम है क्योंकि इससे ईंधन के आयात को कम करने में मदद मिलेगी। मंत्री तेली ने कहा कि, मेघालय और पूर्वोत्तर के अन्य राज्यों में तेल और प्राकृतिक गैस की खोज जल्द ही शुरू होगी। उन्होंने कहा कि, केंद्र सरकार भारत को ऊर्जा आवश्यकताओं में एक आत्मनिर्भर देश बनाने के उद्देश्य से इस पर ध्यान केंद्रित कर रही है।

खांडसरी शुगर पर लगेगा 5 प्रतिशत जीएसटी-

वित्त मंत्री निर्मला सीतारमण की अध्यक्षता में 47वीं जीएसटी बैठक में कई निर्णय लिए गए है। जिसका असर 18 जुलाई 2022 से दिखाई देने लगेगा। आपको बता दे, गुड़ और खांडसरी शुगर पर अब 5 प्रतिशत जीएसटी लगेगा। अधिसूचना के मुताबिक सभी प्रकार के गुड़ पर जीएसटी लागु किया गया है, जिसमे Cane Jaggery (Gur), Palmyra Jaggery भी शामिल है। पूर्व-पैक, लेबल गुड़ और खांडसरी शुगर पर 5 प्रतिशत जीएसटी लागु होगा। यह 18 जुलाई 2022 से प्रभावी होगा।

ISMA ने मिलों को नुकसान से बचाने के लिए अतिरिक्त 10 LMT चीनी निर्यात करने की अनुमति मांगी

इंडियन शुगर मिल्स एसोसिएशन (ISMA) ने जून 2022 में सरकार को पत्र लिखकर चीनी के निर्यात के लिए 10 LMT अतिरिक्त मात्रा की मांग की थी। एक बार फिर उद्योग निकाय ने अपनी चिंता व्यक्त करते हुए मांग दोहराई है और कहा है कि चीनी मिलों ने निर्यात के लिए 17 LMT चीनी के लिए आवेदन किया था, लेकिन केवल 8 LMT के लिए Export Release Orders (EROs) जारी किए गए थे।

गन्ना प्रतियोगिता में सहारनपुर के किसानों का बोलबाला-

क्षेत्रीय गन्ना प्रतियोगिता में सहारनपुर के किसानों का बोलबाला रहा, और पहले तीन स्थान हासिल किए। इस प्रतियोगिता में गांव महेशपुर निवासी किसान सतीश ने प्रति हेक्टेयर 1506.50 क्विंटल गन्ना पैदा कर पहला स्थान हासिल किया। महेशपुर गांव का ही दूसरा किसान अमित कुमार ने 1498.50 क्विंटल प्रति हेक्टेयर गन्ने का उत्पादन किया और दूसरे स्थान पर रहा।

केंद्रीय मंत्री नितिन गडकरी ने sugarcane harvester को लेकर महाराष्ट्र के मुख्यमंत्री एकनाथ शिंदे को लिखा पत्र-

केंद्रीय सड़क परिवहन एवं राजमार्ग मंत्री नितीन गडकरी ने महाराष्ट्र के मुखमंत्री एकनाथ शिंदे को पत्र लिखकर आने वाले पेराई सीजन के लिए केन हार्वेस्टर (sugarcane harvester) की खरीद के लिए सब्सिडी देने की आवश्यकता को बताया है। मंत्री गडकरी ने पत्र में आगे कहा है कि, प्रदेश में हर साल की तरह इस साल भी गन्ना पेराई सत्र शुरू होने जा रहा है। पिछले सीजन

में मजदूरों की भारी कमी के कारण पेराई सीजन अतिरिक्त चला था। गन्ना पेराई सत्र में देर तक चलने के कारण चीनी उत्पादन पर इसका प्रतिकूल प्रभाव पड़ा और वित्तीय नुकसान भी हुआ।

महाराष्ट्र का एथेनॉल उत्पादन अगले साल 140 करोड़ लीटर तक पहुंचने की संभावना-

चीनी उद्योग के अनुसार, अगले साल महाराष्ट्र का एथेनॉल उत्पादन 140 करोड़ लीटर तक पहुंच जाएगा। नेशनल फेडरेशन ऑफ को-ऑपरेटिव शुगर फैक्ट्रीज लिमिटेड के अध्यक्ष जयप्रकाश दांडेगावकर ने कहा, बढ़ते एथेनॉल उत्पादन के चलते चीनी उद्योग को आने वाले समय में ऊर्जा उद्योग भी कहा जाएगा।चीनी मिलें एथेनॉल का उत्पादन में अग्रेसर है, और 1 दिसंबर से 30 नवंबर तक इसका उत्पादन चक्र है। 2020-21 में, महाराष्ट्र ने 78 प्लांट के माध्यम से 100.36 करोड़ लीटर एथेनॉल का उत्पादन किया था। अगले साल उत्पादन 130 से 140 करोड़ लीटर तक पहुंच सकता है।

पेट्रोल में एथेनॉल मिलाने से पिछले 7-8 साल में देश के करीब 50,000 करोड़ रुपये विदेश जाने से बचे है:-

विश्व जैव ईंधन दिवस के अवसर पर प्रधानमंत्री नरेंद्र मोदी ने राष्ट्र को 2 जी एथेनॉल संयंत्र समर्पित किया। देश में जैव ईंधन के उत्पादन और उपयोग को बढ़ावा देने के प्रयासों को मजबूत करने के लिए हरियाणा के पानीपत में संयंत्र स्थापित किया गया है। इस संयंत्र को राष्ट्र को समर्पित करने का यह कदम देश में जैव ईंधन के उत्पादन एवं उपयोग को बढ़ावा देने हेतु सरकार द्वारा सालों से उठाए गए कदमों की एक लंबी श्रृंखला का हिस्सा है। यह कदम ऊर्जा क्षेत्र को अधिक किफायती, सुलभ, कुशल और टिकाऊ बनाने के प्रधानमंत्री के निरंतर प्रयासों के अनुरूप है।

केंद्र सरकार द्वारा पेट्रोल में एथेनॉल समिश्रण पर जोर-

प्रधानमंत्री नरेंद्र मोदी ने कहा कि, देश के किसानों की आय दोगुनी करने के लिए केंद्र सरकार हर मुमकिन कोशिशों में जुटी है, और एथेनॉल उत्पादन को बढ़ावा उसी कोशिश का अगला कदम है। उन्होंने कहा, भारत ने तय समय से पहले ही पेट्रोल में 10 प्रतिशत एथेनॉल मिलाने का लक्ष्य हासिल कर लिया है, और साथ ही हमने बड़े पैमाने पर विदेशी मुद्रा की भी बचत की है।

उत्तर प्रदेश: गन्ना बकाया भुगतान को लेकर मुख्यमंत्री योगी आदित्यनाथ सख्त-

उत्तर प्रदेश में गन्ना बकाया भुगतान को लेकर राज्य सरकार सख्त हुई है, और अब मुख्यमंत्री योगी आदित्यनाथ ने भुगतान में विफल मिलों के खिलाफ नोटिस जारी करने के निर्देश दिए है। दैनिक जागरण में प्रकाशित खबर के मुताबिक, मुख्यमंत्री योगी आदित्यनाथ ने मंडलीय विकास कार्यों की समीक्षा कर चीनी मिलों के गन्ना भुगतान में आ रही समस्याओं के लिए जनपद स्तर पर नोटिस जारी कर कार्रवाई करने के निर्देश दिए।

केंद्रीय मंत्री नितिन गडकरी ने एथेनॉल उत्पादन पर दिया जोर-

केंद्रीय मंत्री नितिन गडकरी ने कहा कि, तेल के आयात को कम करने और देश को आत्मनिर्भर बनाने के लिए एथेनॉल उत्पादन की ओर मुड़ना चाहिए। वह सकाल मीडिया समूह के Agrowan द्वारा आयोजित एक कार्यक्रम में बोल रहे थे। मंत्री गडकरी ने कहा, भारत सालाना 16 लाख करोड़ रुपये के ईंधन का आयात कर रहा है। अगर सिर्फ 5 लाख करोड़ रुपये कृषि क्षेत्र में लगाए जाते हैं, तो हमारे किसानों को ऊर्जादाता (ऊर्जा प्रदाता) और अन्नदाता (खाद्य प्रदाता) बनने में देर नहीं लगेगी। मंत्री गडकरी ने कहा कि, देश को चीनी की 280 लाख टन आवश्यकता है लेकिन चीनी का उत्पादन उससे अधिक होता है। गडकरी ने कहा कि, एथेनॉल की मांग बहुत अधिक है, और चीनी के बजाय एथेनॉल उत्पादन पर ध्यान देना बेहतर होगा।

ISMA ने की 2022-23 सीजन में 80 लाख टन चीनी निर्यात अनुमति देने की मांग-

पिछले सीजन की तरह आने वाले सीजन में भी देश में गन्ना और चीनी का रिकॉर्ड उत्पादन होने का अनुमान लगाया गया है। रिकॉर्ड उत्पादन के अनुमान के चलते चीनी मिलर्स अभी से अगले सीजन के निर्यात को लेकर एक्शन मोड़ में आते दिखाई दे रहे

है। पिछले सीजन में निर्यात से मिलों के राजस्व में काफी अच्छी बढ़ोतरी हुई थी, जिसके कारण चीनी मिलों को किसानों का समय पर भुगतान करना मुमकिन हुआ था। साथ ही एथेनॉल उत्पादन से भी चीनी मिलों के आय में वृद्धी हो रही है।

HPCL-Mittal Energy Limited, 2023 में बायो-एथेनॉल प्लांट शुरू करेगी-

भारत की एचपीसीएल-मित्तल एनर्जी लिमिटेड (HMEL) {HPCL-Mittal Energy} अपने कार्बन उत्सर्जन को कम करने के उपायों के तहत 2023 में उत्तर भारत में अपनी बठिंडा रिफाइनरी में बायो-एथेनॉल प्लांट शुरू करेगी। एचपीसीएल-मित्तल एनर्जी लिमिटेड के सहायक महाप्रबंधक प्रवीण शिर्के ने एशिया पैसिफिक पेट्रोलियम सम्मेलन में बताया की, हमारी कंपनी अपशिष्ट भोजन जैसे कृषि आदानों के आधार पर प्रति वर्ष 100,000 टन एथेनॉल प्लांट बनाने की प्रक्रिया में है।

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RESEARCH ARTICLE:

ADVENT OF ARTIFICIAL SWEETENERS- IS IT A THREAT TO SUGAR CONSUMPTION?

by

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ABSTRACT

Now a days while direct consumption of sugar is being curtailed, sugar free food is also becoming much popular because of its less calorie content. The food industry uses various artificial sweeteners which are low in calorie content instead of high calorie sugar. U.S. Food and Drug Administration has approved aspartame, acesulfame-k, neotame, cyclamate and alitame for use as per acceptable daily intake (ADI) value. But till date, breakdown products of these sweeteners have controversial health and metabolic effects. On the other hand, rare sugars are monosaccharides and have no known health effects because it does not metabolize in our body but shows same sweet taste and bulk property as sugar. Rare sugars have no such ADI value and are mainly produced by using bioreactor and so despite high demand, rare sugars cannot be produced in the desired quantities. From an industry point of view, approval for usage of sugar substitutes in food products by the regulatory agencies can initiate major trends. These trends can contribute to the safety and health consciousness of consumers and also to food and beverage industries to get better market and price. We have discussed herein reasons for growing use of such alternate sweeteners, measures for curbing sugar consumption and myths associated with sugar consumption and its adverse health effects.

Key words: Alternate sweeteners, obesity, sugary tax.

INTRODUCTION

Since immemorial, sugar is the generic name for sweet-tasting, soluble carbohydrates, many of which are used in food. Sugars are widespread in nature and are the building blocks of carbohydrates. Sugar besides being found in abundance in sugarcane & sugar beet from which it is extracted on commercial scale, is also naturally found in many foods, including milk, grains, fruit, and vegetables. The sugar naturally found in various foods provides an important fuel source. Certain tissues in the body, such as the brain and red blood cells, exclusively use sugar for energy. Furthermore, these carbohydrate-rich foods provide a variety of other nutrients, such as fibre, vitamins, and minerals. Sugar is also added to many foods, such as breads and other baked goods, cereals, flavoured yogurt, sweetened beverages, and sauces for various reasons.

There is growing debate on sugar consumption vis a vis its adverse effect on human health. Many a times, sugar is held responsible for many of the health issues on account of sugar consumption, resulting in making common consumer think twice before consuming it. As a result, not only per capita direct sugar consumptions, world over are either static or have gone down. The overall increase, whatsoever observed, is due to indirect sugar consumption and increase in population. World Health Organization recommends consuming not more than 10% of daily calories from added sugar and 'free sugars,' such as honey, syrup, or juices. High consumption of added sugars has been

linked to certain illnesses such as obesity, diabetes, and heart disease. We have discussed many such issues here with focus on sugar consumption patterns under Indian conditions and also the myth and realities associated with consumption of sugar.

SUGAR CONSUMPTION PATTERN

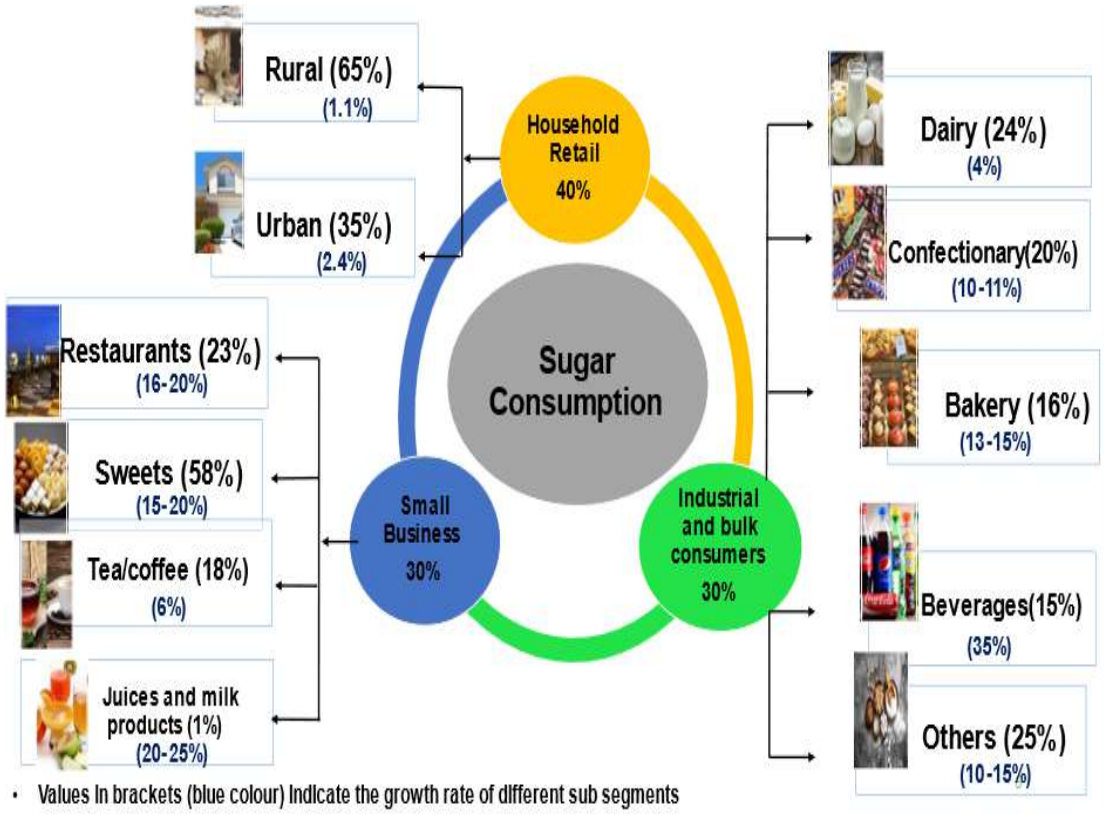
Due to growing media campaign in particular, consumers tend to overestimate the calorie content of sugars while failing to recognize that other carbohydrates and fats may provide the same number of calories or more. People have made a myth in their minds that sugar alone increase their weight. Calorie intake in only one side of the equation. The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended (Mohan. N, et al., 2020). Similarly, they consider sugar alone to be the culprit for various other health issues as discussed subsequently.

Overview of sugar consumption pattern

- Calorie intake has increased by over 30% in the last 50 years, but only a small fraction of this gain can be attributed to sugars.
- Sugar consumption per capita has been decreasing or flat across various countries.
- Fruit, fruit juices and milk are rarely seen as sources of sugar.
- Consumers are confused as to what really the facts are and what are just myths.
- Changes in lifestyle has led to overall imbalances in food intake and energy expenditure.

As regards India, sugar consumption structure has been depicted in Fig. 1 given below.

Fig 1: Indian Sugar Consumption Structure



As can be seen almost 40% of total sugar consumption is household and major sugar consumption (about 60%) is made by bulk/industrial consumers. The table no. 1 gives details of major industrial houses consuming sugar in plenty.

Table no. 1 Major players contributing towards consumption of sugar in India

Industry	Consumption in MMT per Annum	Major players
Dairy Processing	1.50	Nestlé, Mother Dairy, Cream Bell, GSK
Confectionaries	1.50	Parry, Perfetti, Rigley, Cadbury, Lotte
Biscuits	1.20	ITC, Britannia, Parle
Bakery	1.20	ITC, Britannia, Parle, Haldiram
Beverages/Juices	1.60	PepsiCo, Coke, Parle Agro
Others	1.00	Rasna, Harshey
Sweets	8.00	Haldiram, Bikanerwala
Household	10.50	
Total	26.50	

SUGAR AND HEALTH- FACTS AND REALITIES

In today's health driven society, people often consider usage of products which gives them health benefits. Now a days health consciousness has turned back the consumption of sugar and has created demand for alternate sweeteners. Some facts might be true whereas most of them are just myths which have been planted in people's mind. Here we have listed a few myths about the consumption of sugar and also factual situations.

- **Myth: Sugar causes obesity**- Added sugar especially from sugar sweetened beverages is thought to be the main culprit for the rising rates of obesity worldwide.
  Fact: Excess calories from all food and beverages, including sugars, can lead to weight gain, increasing the risk of obesity and other chronic diseases; however, research does not indicate that there is a direct link between sugar intake and any of these conditions. The studies conducted by the International Sugar Organisation indicates many cases, people consuming less sugar develop obesity while for those consuming higher quantities the obesity rates have been lower. Thus, no positive correlation between sugar intake and obesity could be established.

- **Myth: Risk of type -2 diabetes**- As per the data available in the public domains, the worldwide prevalence of diabetes has more than doubled over the past 30 years.
  Fact: Sugar has been blamed for being the only reason for the cause of type-2 diabetes among people. Whereas, there are several other factors which are responsible for the same. There has been no scientific evidence which highlights the fact that there is a direct link between the consumption of sugar and having type-2 diabetes. It is attributed to be genetic rather than having a direct link with the consumption of sugar.

- **Myth: Sugar causes Addiction-** It is said that excess consumption of sugar may become addictive after a certain point of time.

Fact: Scientific evidence does not support the idea that sugar (or any other foodstuff) can be addictive. Eating something you enjoy increases dopamine in the same way all pleasurable experiences do, but addiction and pleasure are not the same thing.

- **Myth: Sugar causes cancer**- Some believe that consumption of more than the actual amount of sugar needed by an individual's body might cause cancer.
  Fact: Sugar is not a carcinogenic (cancer-causing) substance. However, over-consumption of sugar, specifically added sugar in processed beverages and food without taking care of the physical activity & energy balance may contribute to obesity which is an important risk factor for cancer. There is no evidence that consuming sugar makes cancer cells grow faster or cause cancer.

- **Myth: "Sugar results in Dental caries"- Dental caries are caused due to the excess consumption of sugar or sugary things for ex. Chocolate, candies etc.**
  Fact- The occurrence of dental caries is very common in children. The reason given for this that the children tend to consume chocolates and candies in higher proportion than that of adults. But that is not what the reality is as dental caries may be caused when oral hygiene is not maintained. Sugar is not acidic, therefore cannot directly harm our teeth on its own. The bad bacteria form acid/plaque by feeding on and metabolising several foods, and not only sugar. Sticky foods are more dangerous and too much snacking, not giving time between meals for the saliva or water to wash away the acid or plaque, are more dangerous. Regular cleansing and washing, including brushing and flossing will check all teeth decay, and allow us to eat anything we want.

MEASURE TAKEN TO CURB THE CONSUMPTION OF SUGAR

Humans tend to include sugar in almost every meal of the day. Either a sweet drink or a dish is compulsory in every household along with each meal during the day. During the pandemic and otherwise also WHO gave an advisory to curtail the consumption of sugar. This has prompted people to shift their consumption from sugar to various other types of alternate sweeteners. As discussed in earlier paragraphs, there are growing debates on sugar consumption and consequential health issues like obesity, type-2 diabetes, heart disease, cancer, tooth decay etc is said to be caused by the consumption of added sugar, which is the sugar found in sodas, sweets, and other processed foods. Therefore, Sugary tax has been imposed in some countries to minimize the consumption of added sugar in one's diet. One such example is Thailand which is forcing soft drink manufacturers to reduce the amount of sugar in their beverages with new taxes. Carbonated drinks are the initial targets, sweetened fruit juices, teas, and coffees to follow. However, the manufacturers may face difficulties persuading their customers to accept less sugar. The new tax is being welcomed as a step in the right direction by the health campaigners who say it only targets the soft drink market.
The Thai Excise Department implemented for first time ever, an excise sugar tax on certain beverages to reduce consumption of sugar and to increase health consciousness. Beverages subject to the new excise sugar tax are as follows:

1. Artificial mineral water, soda water, and carbonated soft drinks without sugar or other sweeteners and without flavour.
2. Mineral water and carbonated soft drinks with added sugar or other sweeteners or flavours; and other non-alcoholic beverages
3. Fruit and vegetable juices
4. Coffee and tea
5. Energy drinks

6. Beverage concentrates to be used with beverage vending machines for distribution at retail areas. On the similar lines certain countries which have imposed the sugary tax have been listed below in Fig 2.

Fig 2. The Sugary Tax

The aim for improving sugary tax is aimed at reducing the consumption of sugar with a view to provide better health.

ALTERNATIVE SWEETENERS

With a view to make food healthier, alternative sweeteners are considered as mere alternatives to sucrose and other mono and disaccharides that provide the same or higher level of sweetness as that of sugar. More and more such sweeteners have been developed to provide zero calorie or low calorie sweetening for foods and drinks, thus considering it to be healthier.

Such alternative sweeteners may be categorised into:

- Artificial sweeteners
- Natural sweeteners

ARTIFICIAL SWEETENERS

Artificial sweeteners are synthetic sugar substitutes. They are many times sweeter than real sugar, which changes human tolerance for sweet things. However, even zero calorie artificial sweeteners may not be completely healthy (Mohan. N, et al., 2020). Some of, common artificial sweeteners are:

- Aspartame
- Sucralose
- Acesulfame K
- Saccharin
- Xylitol

NATURAL SWEETENERS

Natural sweeteners may appear healthier than processed sugar, however, small traces of antioxidants, vitamin and minerals are not enough to make a significant difference when it comes to your health. Common natural sweeteners include:

- Honey
- Dates
- Sugar

- Coconut sugar
- Maple syrup
- Molasses
- Agave nectar

INCREASING CONSUMPTION OF ALTERNATIVE SWEETENERS

Market overview

Indian food sweetener market is expected to grow at a CAGR of 1.1% during the forecasted period of (2019-2024) (2):

- India is considered to be the largest or second largest producer and the biggest consumer of sugar in the world. The increasing demand of sweeteners is due to the high consumption of sugar based products which is considered to lead to a number of health issues like diabetes, obesity, cardiac disease etc.
- Due to the changed regulatory environment and permission for using sweeteners in dairy products, biscuits and confectionary, alternative sweeteners are experiencing high demand in India and other countries.
- The increased media campaign against sugar, portraying it as a sweet poison has also had an impact on the demand of artificial sweeteners and the demand is growing.

USE/APPLICATION OF ARTIFICIAL SWEETENERS

There is a growing trend in the use of artificial sweeteners these days in place of sugar because of reasons described earlier. Generally, artificial sweeteners are widely used in processed foods, including:

- Soft drinks, powdered drink mixes and other beverages
- Baked goods
- Candy
- Puddings
- Canned foods
- Jams and jellies
- Dairy products

Artificial sweeteners are now being use in general households also. They are commonly used in baking and cooking. The label on artificial sweeteners must be checked for the right amount of domestic usage, some of them may even leave an aftertaste. A different artificial sweetener or a combination may be more appealing, at times.

ARE ARTIFICIAL SWEETENER SAFE?

Artificial sweeteners or as some may say sugar alcohols which are commonly used, and the demand is rapidly increasing with the growing consciousness in people about their health. On the other hand, a question arises are these sugar alcohol completely safe for human consumption or not. Numerous studies have laid emphasis on the point that sugar alcohols are safe when consumed in a limited quantity. Excess consumption of anything may have ill effects on your health. Following side effects of consuming sugar alcohols have been reported.

1. **Laxative effect**
   This has been commonly noted in people who suffer with irritable bowel syndrome (IBS) and children. Rather than absorbing the sugar alcohols in the stomach they tend to linger in the intestines and ferment.

2. **Weight gain**
   Sugar alcohols also tend to increase the weight of people when consumed in excess quantities. These might be low in calories and carbs but are not entirely free from it.

3. **Gastrointestinal issues**
   Sugar alcohols are not completely digested by the body, therefore one may experience some unusual and unpleasant gastrointestinal problems soon after they are consumed.

4. **Sugar substitutes can alter gut microbiome**
   Many of us regularly reach for a diet drink or stir a sachet of sweetener into our coffee in an effort to keep sugar intake down. But in an ironic twist, a trial has found some healthy adults had less control over their blood sugar levels after two weeks of consuming sugar substitutes in amounts below the recommended daily allowance. Our gut microbiome's main function is to help us break down food, but it can affect our body from head to toe. Different bacteria secrete different chemicals into our blood, and these compounds can affect how our organs work. We do not know why some groups of bacteria go extinct in the presence of each sweetener maybe the sweeteners are toxic, or maybe they affect some specific energy metabolism of the bacteria. Sweeteners might also change cells in the intestinal lining, making parts of the gut more habitual for some bacteria over others, and change the microbiome composition that way.

It is out of place to mention that WHO also reported that while sugar substitutes may be useful for short-term weight loss, they also come with other long-term risks. It cites systematic analysis that showed non-nutritive sweeteners tend to coincide with weight gain and high BMIs over long-term periods. It also noted that, some data showed an increased risk of type two diabetes, cardiovascular diseases, and mortality in adults.

ECONOMICS OF ARTIFICIAL SWEETENERS

Food companies can save costs by using a blend of artificial sweeteners for beverage application and also in food items where required. For example, ace-k and aspartame are used in the beverage industry for carbonated soft drinks like colas, which are very competitive in comparison to sugar (4). If we consider the purchase price of the high intensity sweeteners on per kg basis it can be said that in reality it is quite high. On the other hand, if we see the sweetening power of these sweeteners which is much higher than sugar, it can be summarized that quite a good amount of cost saving is done. This is so because when the sweetening property of these sweeteners are higher than compared to that of sugar then a small proportion of it is used, hence cost saving is done. Price of intense sweetener as compared to sugar are given below in table no. 2.

Table 2: Price of intense sweetener as compared to sugar

Sweetener	Price relative to Sugar
Sucrose	1
Luo Han Guo	0.72
Stevia	0.36
Sucralose	0.15

Aspartame	0.08
Acesulfame K	0.04
Saccharin	0.02

Therefore, it can be observed that artificial sweeteners are cheap in comparison to sugar. In many cases they are 4% or less the cost of sugar and in some cases down to almost 1%. Thus, the food or beverage manufacturers or other users experience cost saving.

CONCLUSION

While analysing the whole situation, it emerges that tagging sugar as the only culprit for the cause of various health issues might compel the consumers to shift their consumption to some other alternative food or beverages that have low calorie content which in turn are not so good for one's health. Further, Obesity and other health problems are also caused due to a person's lifestyle and sugar cannot be held responsible for it. It is more due to energy imbalances rather than due to intake of sugar alone. As the studies indicate, implication of any sort of taxes may not curb down the consumption of sugar as some might say, whereas alternate sweeteners also pose some ill effects.

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ABSTRACTS

GLOBAL STATUS OF SUGARCANE AGRICULTURE AND SUGAR INDUSTRY, by **Bakshi Ram, Director, ICAR-Sugarcane Breeding Institute, Coimbatore, July-2022, Indian Sugar**

On industrial scale over 103 countries are producing white sugar using sugarcane and sugar beet as raw materials (FAOSTAT, 2018). Brazil, India, Thailand, China, Mexico, Pakistan, U.S.A., Australia and South Africa are the major cane-sugar producing countries whereas Russia, France, U.S.A. and Germany are the major beet-sugar producing countries. Some countries such as China, Egypt, European Union, Japan, Russian Federation and U.S.A. are producing both cane-sugar and beet-sugar (www.isosugar.org). Sugarcane contributes ~78% of the World's crystal sugar production whereas sugar beet contributes to 22% (www.ragus.co.uk). Sugarcane is a tropical annual crop whereas sugar beet is a seasonal and temperate crop. Raw sugar and refined sugar is produced from sugarcane whereas sugar beet is directly processed and refined sugar alone are produced. Both raw sugar and refined sugar are traded internationally.

EFFICIENT MANAGEMENT FACTORS OF INDIAN SUGAR SECTOR, by CA K.Marimuthu, Executive Vice President, Gem Sugars Limited, August – 2022, Indian Sugar

Sugar production in India has been cyclic in nature. An estimated 75 per cent of the population depends on the sector either directly or indirectly. Sugar industry is also expected to develop further, thereby offering more employment opportunities to a number of semi-skilled and skilled workers in the rural areas of the country thereby contributing towards their development. The sugar industry also supports diversified ancillary activities and skills that support the local economy.

Ikshu Kedar : A Cutting-Edge ICT Solution to Help Sugarcane Farmers Improve their Profits via Water Saving in sub-tropical India, by Ram Ratan Verma, T.K Srivastava, S.S. Hasan and Pushpa Singh, ICAR-Indian Institute of Sugarcane Research, Lucknow, September – 2022, Indian Sugar

Sugarcane cultivation provides base to the Indian rural economy. Adequate and timely irrigation of sugarcane fields is necessary for higher sugarcane productivity. The crop is considered a high water demanding crop. It covers about 60% of entire sugarcane crop area in sub- tropical states of India where Ground water is the main source for irrigation in these states. Regular extraction of ground water for irrigation purpose is receding down the water table by 2-3 m per annum. It has been noticed that farmers continue to apply irrigation water often and in excess amounts in order to achieve its beneficial response on cane yield. This practice results in the waste of precious water and raises the cost of crop irrigation. Therefore, there was an urgent need for irrigation scheduling in sugarcane crop for efficient utilization of irrigation water.

Improving yield and cane quality through implementation of harvesting best practice – 2019 Herbert demonstration, by A Douglas, B Nothard, CA Norris, J. Stringer, M Olayemi, P Patane, T Pfumayaramba, Internation Sugar Journal, July 2022.

In 2019, the Australian sugarcane industry conducted a month-long demonstration with

12 trials to determine the commercial viability of harvesting best practice. Initiated by a small group of innovative growers and contractors from the Herbert region, the concept of a commercial demonstration sought to determine both agronomic and economic impacts of adopting HBP, including the assessment of possible yield gains without having a detrimental impact on extraneous matter, and economic implication for growers and harvesting contractors arising from revenue and harvesting cost changes.

Comparative clarification performance of three different short retention time clarifiers in one Louisiana sugarcane factory, by Gillian Eggleston , Luis Acevedo, Maria del Carmen Perez, Peter Gaston, Stephania Imbachi-Ordonez, Internation Sugar Journal, July 2022.

Sugarcane juice clarification is integral to the raw sugar manufacturing process. A comparative investigation between three short retention time (SRT) clarifiers of different designs, operating in parallel at one Louisiana (LA) sugarcane factory, was undertaken to evaluate their performance across a processing season. The factory used a hot lime clarification process in one Fletcher Smith clarifier and two LLT clarifiers; LLT1 had 9 turbulence reduction devices (TRDs) and LLT2 had 18 TRDs.

SCHLOT Live: changing the harvesting game with real-time cane-loss monitoring, by Chris P Norris, Stuart C Norris, Internation Sugar Journal, August 2022.

SCHLOT Live is a real-time cane-loss quantification system for sugarcane harvesters, making this information available to both the operator and other value-chain stakeholders. SCHLOT Live measures the net power consumption of the extractor fans as they "process" the extracted trash and billets and utilises embedded algorithms, other measured parameters and relevant operator inputs to derive a commercially viable estimate of cane loss under widely varying harvesting and field conditions.

An innovative solution for air pollution control in spent wash-fired incineration boilers: A case study from Daurala Sugar Works, by Prakhar Verma, Rajesh Verma, Internation Sugar Journal, August 2022.

Following the inception of "Spent Wash fired Incineration Boilers" to reduce the water pollution, as part of the "Zero Liquid Discharge" policy enforced by the Central Pollution Control Board of India for molasses-based distilleries, the Industry has been facing severe issues with "Air Pollution Control" (APC) on such installation. Due to the complex nature of dust generated from the combustion of concentrated spent wash, the conventional APC devices have not been able to satisfy the end-users on most fronts, i.e. Results, Operability & Maintenance. The authors, being at the forefront of developing & bringing new technologies in this field, recognised the limitations of conventional technologies on this particular application and started looking for an economically viable solution.

Maximising the benefits of NIR rapid analysis for sugarcane mill laboratories, by Joel M Simpson, Stephen P Staunton, Internation Sugar Journal, September 2022.

Obtaining, training and retaining laboratory personnel for Australian sugarcane mills is a growing concern within the industry. The test

duration for some primary laboratory methods is often too long to make the required process adjustments in time, such as altering the high-grade centrifugal settings. Once established, near-infrared (NIR) laboratory instruments using mature calibrations provide many advantages that address both issues, such as ease of use, speed of analysis, multiple constituent results generated in one scan for multiple mill products, and precision and accuracy of results.

Isolation and analysis of microbial contaminants from Louisiana raw sugarcane factories, by Evan Terrell, Gillian O. Bruni, Isabel M. Lima, K. Thomas Klasson, Yunci Qi, Internation Sugar Journal, September 2022.

A persistent challenge during raw sugar production is the mitigation of the growth of microbes that consume sucrose and produce polysaccharides. Here, a sugarcane-based growth medium, CJ+, was developed and utilized along with molecular microbiology approaches to isolate and identify microorganisms present in Louisiana raw sugarcane factories. In addition to the well-known Leuconostoc, several other bacterial and yeast genera were identified. All these microbes contribute to sucrose degradation, with some consuming greater quantities as measured by high performance liquid chromatography (HPLC).

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