



# NATIONAL SUGAR INSTITUTE

KANPUR – 208017 (U.P.) INDIA

## Message from Director's Desk



The sugar production in the country during the season 2020-21 is expected to remain about 30.8 MMT in spite of expected all time high sugar exports to the extent of 6.5 MMT and diversion of sugar through B Heavy molasses and cane juice/syrup for ethanol production.

On the ethanol blending front also, till May 2021, the country has achieved a blending percentage of 7.66 and there are all possibilities to touch 8.00 or even more. Now with the recent amendments in the sugarcane control order, the ethanol production is expected to get a boost. Institute remained active in interacting with the distillation industry to suggest them various models of sugar diversion and solving their issues with respect to use of syrup for ethanol production.

The institute is now gearing up for the next academic session 2021-22, which, for the fresher's shall commence from September 2021. The session had to be delayed due to Covid-19 situation in the country which necessitated postponement of entrance examination too to July 2021.

Wishing all of you to remain safe and healthy.

**Narendra Mohan**  
Director

April – June  
2021

NEWSLETTER

Visit us at:  
<http://www.nsi.gov.in>  
Contact: [nsikanpur@nic.in](mailto:nsikanpur@nic.in)

## WEBINARS ORGANIZED:

1. Under the Auspices of "**Aazadi Ka Amrut Mahotsav**", a National Webinar was organized on 10<sup>th</sup> May 2021 by National Sugar Institute, Kanpur on important topic "**Sugar Industry- Potential for Providing Bio-energy & Oxygen**". About 200 delegates from different sugar producing states participated. Prof. D Swain, Prof. Sugar Engineering, NSI, Kanpur presented issues in utilizing existing MSDH facilities available in ethanol plants for utilization in production of oxygen.

Part/Product/Byproduct	Quantity in kg per ton of cane crushed	Calorific Value in kcal/kg	Calorific
SAR	125	30	
sugar	100	41	
Bgasse	300	22	
Filtercake	35	18	
Molasses	45	2570	
<b>Total</b>			115050 91 1650900 749 1920 units

Bagasse is only used for energy production  
Efficiency varies from 11-21 % depending upon the steam parameters

*75-आजादी का अमृत महोत्सव*

2. National Webinar on "**Standardization of Capacities of Ethanol Plant & Modelling of Ethanol Production**" was jointly organized by National Sugar Institute & SISSTA on 15<sup>th</sup> June 2021. The webinar was addressed by Joint Secretary (Sugar & Admn.), Director, NSI and other eminent experts. Presentations were made on the need for standardizing the ethanol plant capacities and on possible routes for sacrificing sugar to produce ethanol. More than 200 delegates from various sugar producing states participated.



## RELEASE OF BOOK:

Book entitled "**Sugar and Sugar Derivatives-Changing Consumer Preferences**" by Narendra Mohan and Priyanka Singh was released on 13<sup>th</sup> April 2021 at NSI Kanpur. Dr. Rajshekhar, Commissioner Kanpur Division graced the occasion. The book contains history of development of sugar production process, specification of various types of sugars, specialty sugars and other sweeteners and also artificial sweeteners.



## ONLINE MEETING:

National Sugar Institute, Kanpur is to set up a "**WELLNESS CENTRE**" at its campus for providing healthcare facilities to the students. This was decided after an online meeting between the institute administration and officials of various sugar companies including sugar machinery manufacturers. The proposed "**WELLNESS CENTRE**" shall be a four bed air conditioned centre with OPD (outpatient department) facilities to students and staff.





## BRAIN STORMING SESSION:

Brain Storming Session on "**After Co 0238-What Next**" was organized by the institute on 29th June 2021. It was inaugurated by Shri Sanjay R Bhoosreddy, Addl. Chief Secretary, Sugar Industry & Cane Development and Excise Department, Commissioner Cane & Sugar, U.P. Shri V K Shukla, Addl. Cane Commissioner, U.P. also graced the occasion. Eminent experts including Dr. A D Pathak, Director, IISR, Lucknow, Dr. J Singh, Director, UPCSR, Shahjahanpur and Shri R L Tamak, ED & CEO, M/s DCM Shri Ram Ltd. presented their views on futuristic approach to develop newer sugarcane varieties.



## LECTURE DELIVERED:

1. Expert Lecture for the benefit of students of Alcohol Technology (DIFAT) was delivered by Mr. Sanjeev Verma, Distillery Head, M/s DCM Shri Ram Ltd., Unit: Hariawan on 31<sup>st</sup> May, 2021. Useful practical hints were provided by him for efficient operation of molasses based ethanol plants.



2. For the benefit of students and staff of the Institute, Expert lecture on the topic "**Production of Refined/Chemical Free and Specialty Sugars**" was delivered by Mr. Panduranga Rao, Vice President (Technical), Shrijee Group on 4<sup>th</sup> June 2021. Marathon lecture covered various details of refining and particularly secondary de-colorization, PAC vs Ion Exchange (IER) etc.



3. Director, National Sugar Institute, Kanpur delivered a lecture on the topic "**Sugar Quality, Consumption & Supply Chain Management**" during the expert lecture series organized by M/s Shrijee Process Engineering Works Ltd., Mumbai. The programme was organized online on 23<sup>rd</sup> June 2021, and was attended by more than 250 delegates. Director, National Sugar Institute, Kanpur discussed the need for producing sugar from raw-refined route and adopting safe processing & packaging. He also discussed about the need for implementing Quality Management System (QMS) in sugar factories.



4. Expert Lecture on the topic "**Efficient Milling Technologies**" was delivered by Mr. P S Srivastava, Eminent Sugar Engineer and Managing Director, Enmill Technologies on 24<sup>th</sup> June 2021. Mr. Srivastava, who is also an alumnus of National Sugar Institute, Kanpur discussed recent development in milling technology with an aim to enhance extraction with lower power requirements.



## RESEARCH

### 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

- On interpretation of the FT IR spectrum of the reaction mixture, it has been observed that prominent peaks for the vanillin-based motif is missing and peaks for other phenolic aldehydes are present. Thus, there is a need to change the reaction condition to transform the lignin into vanillin based aldehydic motif. The experiments on these activities are under progress.

### 2. Studies on synthesis of lactic acid from sugarcane bagasse hemicellulose –

Experiments have been performed for the production of lactic acid from pure xylose. In order to determine the concentration of lactic acid in reaction mixture is in under progress.

**3. Studies on pot-efficient synthesis of alkyl-levulinates (Als) using sugarcane bagasse derived cellulose –** The isolated yield of product obtained after purification is 5% on dry bagasse basis. In order to compile the results towards filing patent, literature study on available patents on this product is under progress. The draft application for filing patent on the developed methodology is also under progress.

**4. Studies on Production/isolation of C5 – Sugar Alcohol/Sugar using by-product resources of sugar industry -** The experiments related to synthesis of xylitol and its determination/identification in reaction mixture have performed by using the procured microbial species (P. farinose NCIM 3461; C. Tropicalis NCIM 3119) and bagasse derived hemicellulose, however results obtained under these studies till date are not fruitful in terms of synthesis of xylitol.

**5. Standardization of method for determination Preparatory Index -** Based on the experiments conducted and results found in research lab, a research paper is being prepared for publication.



**6. To study the impact on performance of mechanically coupled twin induction motor drives for Shredder/Fibrizer having unequal sharing of load and to design & develop dedicated drive for the application -** One of the major items, Phase



Shift Transformer has been procured. Its parameters are studied. Reduction in THD to be studied at the institute's factory.

**7. Utilization of Potash Rich ash for production of valuable bio fertilizer** - Field experiment on sugarcane crop is on-going so as to assess the effect of bio-fertilizers on its growth and quality of sugarcane as well.

**8. Comparative study of Nine varieties of sweet sorghum for production of ethanol yield** - Out of nine only five sweet sorghum varieties namely Phule Vasundhara, CSH 22SS, SSV 84, SSV 74 and ICSSH-28 performed better as compared to other varieties. So these varieties will be considered for further trials and thereafter it will be tested for ethanol production.



#### **RESEARCH PAPERS/BOOK CHAPTERS:**

1. A research paper on **“A Case Study on Augmentation of Ethanol Based Hand Sanitizer Production Capacities in India”** is published in Indian Sugar- April 2021, by Narendra Mohan and V.P. Srivastava.

2. A research paper on **“Bio-Energy from Indian Sugar Industry: A Sustainable Renewable Energy Future”** by Narendra Mohan & Anoop Kumar Kanaujia, published in International Journal of Engineering Research & Technology (Volume 10, Issue 05 May 2021).

3. A research paper on **“Utilization of Bagasse for Production of Various Value-added Products”** by Narendra Mohan & Anushka Agarwal, published in Sugar Cogeneration Handbook, Cogeneration Association of India (pp 58-65).

4. A research paper entitled **“Oxygen Production in Sugar & Ethanol Units- Opportunities & Challenges”** by N. Mohan & D Swain has been published in Emerging Technologies and Innovative Research (JETIR) journal, volume 8, issue 6.

5. A research paper entitled **“Optimization for Achieving Higher de-colorization Efficiency in Sugar Refineries”** by N. Mohan & Mahendra Kumar Yadav has been published in Emerging Technologies and Innovative Research (JETIR) journal, volume 8, issue 6.

6. A research paper on **“Sugar Industry: Importance of By-Product Valorization”** by N. Mohan & Anushka Agarwal has sent for publication in Cooperative Sugar Journal.

7. A research paper entitled **“A Study on the Potential Use of Solar Energy in Sugar Industry”** by Narendra Mohan & Vinay Kumar is published in Sharkara (April-June 2021), National Sugar Institute, Kanpur.

8. A research paper titled **“Bio-ethanol for economic and environmental sustainability”** by Narendra Mohan has been published in Indian Sugar Journal, volume LXXII, pp 23-33.

#### **CONSULTANCY:**

The consultancy services of the institute were provided to the following on various technical matters relating to diversion of B Heavy molasses, validation of ETP's, preparation of DPR's for various projects etc.

1	M/s Nanglamal Sugar Complex, Nanglamal, District – Meerut, U.P.
2	M/s The Bargarh Cooperative Sugar Mills Limited, District – Bargarh, Odisha.
3	M/s Dalmia Bharat Sugar & Industries Limited, Distillery Unit – Nigohi, District – Shahjahanpur, U.P.
4	M/s The Haryana Cooperative Sugar Mills Limited, District – Rohtak, Haryana.
5	M/s Dhampur Sugar Mills Limited, Unit – Asmoli, District – Sambhal, U.P.
6	M/s Dwarikesh Sugar Industries Limited, Unit – Dwarikesh Nagar, District – Bijnor, U.P.
7	M/s Avadh Sugar & Energy Limited, Unit – Hargaon, District – Sitapur, U.P.
8	M/s Harinagar Sugar Mills Limited, Harinagar, District – West Champaran, Bihar.
9	M/s Triveni Engineering & Industries Limited, Unit – Khatauli, District – Muzaffarnagar, U.P.
10	M/s Saraswati Sugar Mills Limited, Yamunagar, Haryana.

### ANALYTICAL SERVICES:

Besides analysis of sugar & sugar house products, Ethanol and effluents, institute started offering testing of Ethyl Alcohol based Sanitizer in its sophisticated, most modern NABL accredited analytical laboratory. Analytical services were rendered to following:

1	M/s Gobind Sugar Mills Limited, District – Lakhimpur – Kheri, U.P.
2	M/s The Kisan Sahkari Chini Mills Limited, Kaimganj, District – Farrukhabad, U.P.
3	M/s Kisan Sahkari Chini Mills Limited, Sultanpur, U.P.

4	M/s The Kisan Sahakari Chini Mills Limited, Anoopshahr, District – Bulandshahr, U.P.
5	M/s Rudra Bilas Kisan Sahakari Chini Mills Limited, Bilaspur, District – Rampur, U.P.
6	M/s The Ganga Kisan Sahakari Chini Mills Limited, District – Muzaffarnagar, U.P.
7	M/s Sarjoo Sahakari Chini Mills Limited, Belrayan, District – Lakhimpur Kheri, U.P.
8	M/s Dalmai Bharat Sugar & Industries Limited, Unit – Jawaharpur, Sitapur, U.P.
9	M/s Balrampur Chini Mills Limited, Unit – Kumbhi, District – Lakhimpur Kheri, U.P.
10	M/s Dhampur Sugar Mills Limited, Unit – Asmoli, District – Sambhal, U.P.
11	M/s Dhampur Sugar Mills Limited, Unit – Rajpura, District – Badaun, U.P.
12	M/s Dhampur Sugar Mills Limited, Unit – Dhampur, District – Bijnor, U.P.
13	M/s Dhampur Sugar Mills Limited, Unit – Meerganj, District – Bareilly, U.P.
14	M/s Kisan Sahkari Chini Mills Limited, Sampurana Nagar, Distt – Lakhimpur Kheri, U.P.
15	M/s Balrampur Chini Mills Limited, Unit – Babhnan, District – Gonda, U.P.
16	M/s Avadh Sugar & Energy Limited, Unit – Seohara, District – Bijnor, U.P.
17	M/s The Kisan Sahkari Chini Mills Limited, Mahmudabad, District – Sitapur, U.P.
18	M/s Balrampur Chini Mills Ltd., Unit – Akbarpur, District –Ambedkarnagar, UP
19	M/s Balrampur Chini Mills Ltd., Unit – Gularia, , District – Lakhimpur, UP
20	M/s Balrampur Chini Mills Ltd., Unit – Balrampur, District –Balrampur, UP

21 M/s Balrampur Chini Mills Ltd., Unit –  
Tulsipur, District –Balrampur, UP

### SALE OF SUGAR STANDARDS:

Sale of sugar standard grades commenced from 1st October 2020 for the sugar season 2020-21. Standard grades can be procured online also. The details are available on our website <http://www.nsi.gov.in>. Total 221 Nos. of Sugar Factories procured 1111 Nos. Standards till June 2021.

### OUR OTHER ACTIVITIES:

1. Mr. Sanjay Awasthi, President, The Sugar Technologists' Association of India & Business Head (Sugar), ISGEC, India completed his Fellowship of National Sugar Institute carrying out research on "**Bio-gas from Filter Cake/Press Mud**" under Shri Narendra Mohan, Director, National Sugar Institute.

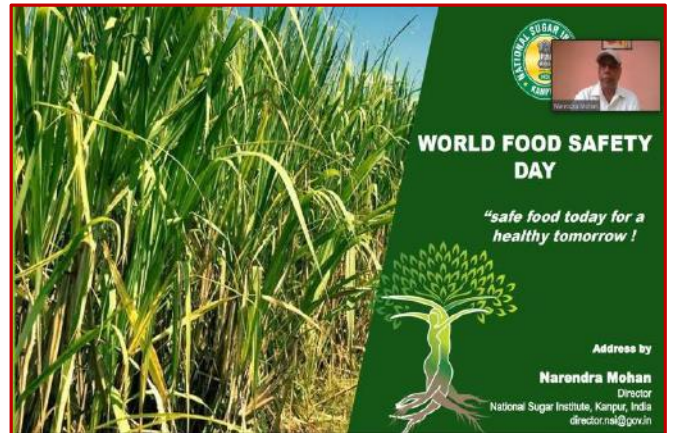


2. राष्ट्रीय शर्करा संस्थान, कानपूर में "विश्व पर्यावरण दिवस" पर वृक्षारोपण कार्यक्रम "वृक्ष हरा, खुशहाल धरा" थीम के साथ संपन्न हुआ। इस अवसर पर संस्थान में एक "हर्बल वाटिका" बनाने का निर्णय लिया गया और इसकी शुरुआत गिलोय, परिजात, अश्वगंधा, तुलसी एवं एलोवेरा की पौधे लगा कर की गयी।

साथ ही निदेशक ने बताया की भारतीय चीनी उद्योग "**लिक्रिड सॉलिड waste मैनेजमेंट**" की नवीन तकनीक अपनाते हुए पर्यावरण की रक्षा के साथ साथ उनसे "मूल्य वर्धित उत्पाद" बनाने का संकल्प ले।



3. Director, National Sugar Institute addressed the Indian and Overseas Students on the occasion of "**World Food Safety Day**". He discussed about safe & hygienic processing in sugar factories and also about various certifications viz. GMP, HACCP, BRC and FSSC 22000, etc.



5. Director, National Sugar Institute, Kanpur participated in the 32<sup>nd</sup> session of ICUMSA which was organized from 14<sup>th</sup> to 16<sup>th</sup> June, 2021 on a virtual platform.





He presented his views on the use of non-lead clarifying agents and for conducting studies on polarizing raw sugar and molasses samples in the NIR region.

6. राष्ट्रीय शर्करा संस्थान, कानपुर द्वारा योग दिवस "योग करो घर पर रहो" की अवधारणा के साथ मनाया गया। संस्थान के निदेशक श्री नरेंद्र मोहन ने स्वयं योग करते हुए संस्थान कर्मियों एवं छात्रों को अपने परिवार के साथ योग करने हेतु प्रोत्साहित किया।



7. राष्ट्रीय शर्करा संस्थान कानपुर में राजभाषा हिंदी को सरकारी कामकाज में बढ़ावा देने हेतु कार्यशाला का ऑनलाइन आयोजन दि 22.6.2021 को किया गया। कार्यशाला में राजभाषा के अधिकतम प्रयोग हेतु गहन चर्चा की गयी। संस्थान द्वारा आयोजित किये जा रहे वेबिनारों को द्विभाषी करने पर भी जोर दिया गया।



8. Online meeting with Institute officials and UP Sugar Mills Association (UPSMA) member factories was organised on 25<sup>th</sup> June 2021 to clarify doubts on diversion of sugarcane juice/syrup for production of ethanol. Matters regarding brix of syrup, recycling of spent wash, treatment of spent wash, re-configuration of evaporators at Sugar Mill were discussed in detail.



9. In pursuit of developing low cost, environment friendly products from sugar cane bagasse which can be made even at micro or small level, NSI, Kanpur developed many utility and decorative items viz. flower pots, pots for indoor plants, key holders and pen stands etc. Production of such type items may be taken up particularly by "Self Help Groups" dominated by women in the vicinity of sugar factories.

