



**January-  
March  
2024**



# **N E W S L E T T E R**

*The January-March 2024 quarter is very important for all offices/institutions. The targets set for the year have to be met and plans for the new financial year are also prepared. In this transition period I assumed the office of Director of the National Sugar Institute on 1<sup>st</sup> March 2024. It is a matter of pleasure for me that I got the opportunity to work as the head of a prestigious institute, NSI Kanpur.*

*We have achieved the target of increasing biofuel content in petrol to 12 percent by 2024 and now working towards achieving the target of 20 percent by 2025. Setting up of a Centre of Excellence at the institute related to biofuels is my priority.*

*Various types of important programs are organized in the institute. An All India Seminar on “Sustainability of Ethanol Production in the Present Scenario” is going to be organized jointly by National Sugar Institute and Sugar Technologists Association of India, New Delhi on 12<sup>th</sup> April 2024. We are organizing a one-day seminar with the collaboration of The Asian Association of Sugar Cane Technologists’ (AASCT), Lucknow on the topic “Planning and Optimization of Resources for Bio-Energy” on 30<sup>th</sup> April.*

*Leading the excellent team of the National Sugar Institute, I aim to take the National Sugar Institute to the pinnacle of success. Let us all strive together for making the institute a symbol of excellence. I am delighted to release this issue of the Newsletter covering all the important happenings and achievements of the institute during this quarter.*

**D. Swain  
Director**

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## ❖ 51<sup>st</sup> CONVOCATION ORGANIZED:

51<sup>st</sup> Convocation of National Sugar Institute, Kanpur was graced by Sadhvi Niranjan Jyoti, Honourable Minister of State, Ministry of Consumer Affairs, Food & Public Distribution and Rural Development and Joint Secretary (Sugar), Government of India on 12<sup>th</sup> January 2024. During the convocation 745 Fellowship, Post Graduate Diploma and Certificates were conferred. Balrampur Chini Mills Ltd. and Dalmia Bharat Sugar Industries announced "**Padamshri Meenakshi Saraogi Gold Medal & Cash Award**" and "**DCM Bharat Sugar Gold Medal**" respectively.



## ❖ CUSTOMIZED TRAINING PROGRAMME:

1. National Sugar Institute, Kanpur organized a customized training programme from 23<sup>rd</sup> January 2024 on "**Quality control & Good Laboratory Practices**" for technical person for Uttar Pradesh Co-operative Sugar Factories. During the training programme, faculty of the institute took the theory as well as practical classes.



2. National Sugar Institute, Kanpur organized a customized training programme 19<sup>th</sup> February 2024 on "**Quality control & Good Laboratory Practices**" for technical



person for Uttar Pradesh Co-operative Sugar Factories (II-batch). During the training programme, faculty of the institute took the theory as well as practical classes.



3. National Sugar Institute, Kanpur organized three day training programme for the officials of Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB) on "**Best Practicable & Available Technologies for Sugar Factories and Distilleries in Control of Pollution & Mitigation Technologies**" at the institute conducted during 12<sup>th</sup> to 14<sup>th</sup> March 2024.



#### ❖ **NEW COURSE ON SUGAR REFINERY OPERATION:**

National Sugar Institute, Kanpur got the permission to start the new short term course on "**Refinery Operation**" from Department of Food & Public Distribution, Ministry of Consumer Affairs, Food & Public Distribution. Admission procedure has been started from 20<sup>th</sup> February 2024.

#### ❖ **DELEGATION FROM FIJI:**

An 18 member delegations of progressive sugarcane farmers from Fiji visited National Sugar Institute, Kanpur on 27<sup>th</sup> February 2024, to seek knowledge about best available technologies for improving sugarcane productivity with minimum inputs. Then director NSI, Prof. Narendra Mohan while welcoming the delegates, presented the activities of the institute and briefed the delegates from Fiji about recent developments in Indian Sugar Industry for making it financially sustainable.



### ❖ VISIT OF BIHAR STATE FARMERS:

National Sugar Institute, Kanpur organized five days exposure visit cum training programme from 11<sup>th</sup> to 15<sup>th</sup> March 2024 for sugarcane farmers from East Champaran, West Champaran and Gopalganj districts of Bihar at institute.



### ❖ RESEARCH ACTIVITIES:

1. **Studies on Sweet Sorghum Bagasse value addition:** The crude 5-Chloromethyl furfural (CMF) derived from fractionated sweet sorghum bagasse cellulose, was synthesized in the presence of chlorobenzene and hydrochloric acid at temperatures of 100 & 120 degree Celsius with vigorous stirring for two hours. Laevulinic acid and formic acid were also extracted from the aqueous layer during process.
2. **Comparative study of five varieties of sweet sorghum for production of ethanol yield:** The trail for five varieties of sweet sorghum were harvested and assessed for ethanol potential in Biochemistry division. Report compilation completed.
3. **Cane juice syrup study for shelf-life and production of alcohol:** Syrup samples were collected and kept at room temperature in Biochemistry division from M/s Yamuna Nagar Saraswati Sugar Mills, Yamuna Nagar, Haryana &

M/s Wave Sugar Mills, Dhanaura, U.P., A unit Detoriation in TRS seen in three month from the date of collection. The sample collected from M/s Balrampur Chini Mills, Maizapur, Gonda showed no detoriation in TRS two month.

4. **Comparative study on polarization by using lead, non-lead, clarificants and NIR polarimetry:** Data compilation work has been completed and research paper on related topic is being prepared.
5. **Production of low G.I. liquid sugar/ low G.I. sugar vitamin 'A' fortified liquid sugar:** Batches of low GI liquid sugar with dosing of Stevia and monk fruit extract were prepared in the month of (May-Feb) and (Oct-Feb) respectively. For the Stevia dosed low GI sugar observations such as solid content, colour, GI value etc. are tabulated in Table-1 below.

Table-1

Parameter	Low GI liquid sugar (Stevia - 10 months)	Low GI liquid sugar (Monk - 3 months)
Solids%	70.55	81.70
Color (IU)	410.56	449.99
GI value	54.98	66.33

No specific changes are observed up to 10 months of storage. However, the monk fruit extract dosed low GI sugar batch did not yield us good results as the GI value did not come within the expected range, the results in respect of colour value, GI

value, solid content are tabulated in the table.

Therefore, to conclude the study it may be said that the produced sugar falls under low GI category with GI value to be around 54 -55. This sugar is also fortified with vitamin A and has assured shelf life for up to 9 months.

6. **Shelf life study of press mud over the period of time:** Ten press mud Samples from sugar factories situated in UP, Bihar, Haryana and Chhattisgarh were collected and stored keeping the environment same as at the factory front. 10 Raw + 10 Treated sample of press mud of each factory as being analyzed for following parameters such as pH, Total Solids (moisture content), Ash content, Total volatile solids (TVS), Lignin and Total Convertible Volatile Solids (TCVS) on monthly basis. During twelvemonths of analysis as observed degradation (Fungal Growth) is occurring in both raw as well as treated press mud samples.
  - The pH of the raw press mud was observed to be in the range of 6.84 – 7.42 while that for PM stab (treated sample) was observed to be in the range of 4.68 – 6.69.
  - The Total Solids for the raw press mud and treated press mud were in the range of 87.6 – 91.12% and 22.31 – 29.31% respectively.
  - The ash content of the stored raw and treated press mud samples

were in the range of 29.39 – 35.21 % and 6.23 – 11.13% respectively.

Therefore, to conclude, it may be said that the PM Stab samples of press mud showed comparatively fair results as compared to the blanks samples kept in parallel study. The PM Stab samples may have good stability for up to 12 months as confirmed with the results furnished by the reports of the study to be further used for production of bio-gas.

#### ❖ RESEARCH PAPERS/ PRESENTATIONS:

1. A research paper entitled **“Mitigating Issues with Sugar Consumption”** by Narendra Mohan & Anushka Akash Kanodia was sent for publication in 8<sup>th</sup> IAPSIT International Sugar Conference ISC-2024 & Sugarcon 2024.
2. A research paper entitled **“Sugarcane Industry: A possible Bio-Energy Hub”** by Narendra Mohan was sent for publication in 8<sup>th</sup> IAPSIT International Sugar Conference ISC-2024 & Sugarcon 2024.
3. A research paper entitled **“Low Glycemic Index (GI) Natural Sugar Fortified with Vitamin A”** by Narendra Mohan, Anushka Akash Kanodia, Shruti Shukla & Svehcha Singh was sent for publication in the conference **“Amifost”** organized by Amity University, Noida on 24<sup>th</sup> March 2024.
4. A research paper entitled **“Mechanical Clarification of Cane Juice and Process Intermediate Products for Superior Quality of Sugar”** by Amresh Pratap Singh & Narendra Mohan was published in Indian Sugar Journal, Vol. No. LXXIV, No. Ten, January 2024.
5. Sh. Anoop Kumar Kanaujia, Assistant Professor (Sugar Engineering) presented article on **“Latest Development in Indian Sugar Industries for Energy Efficiency/Conservation”** in one day workshop on “Best Practices in Energy Efficiency in Sugar Sector- A Path for Decarbonisation” on 21<sup>st</sup> March 2024 organized under the ASPIRE Programme of the Foreign, Commonwealth & Development Office (FCDO) of the UK Government, in collaboration with the Bureau of Energy Efficiency (BEE) at Lucknow, Uttar Pradesh.
6. A paper titled **“A Novel Multilevel Inverter fed Open-End Winding Coupled-Induction Motor Drive For Sugar Industry”** by Vinay Kumar and Sanjiv Kumar was published in the Journal IEEE Transactions on Energy Conservation, Volume 38, Issue 4, pp. 2706-2716.



### ❖ MoU SIGNED:

National Sugar Institute, Kanpur (NSI) signed MoU with Fiji Sugar Corporation Limited, Balawa, Lautoka, Fiji for **“Cooperation in the fields of Sugarcane Processing and Manpower Development”** on 19<sup>th</sup> March 2024.



### ❖ CONSULTANCY SERVICES:

Requests for availing consultancy services of the institute were received and also provided to various sugar factories ethanol & other allied units on various technical matters relating to diversion of B-Heavy molasses/syrup, validation of ETPs, preparation of DPRs, validation of no increase in pollution loads in ethanol units upon enhancement in capacity etc.

Sr. No.	Factory Name
1	M/s Uttam Sugar Mills Ltd., Unit – Libberheri, Haridwar, U.K.
2	M/s The Seksaria Biswan Sugar Factory Ltd., Biswan, Sitapur, U.P.
3	M/s Balrampur Chini Mills Ltd., Unit – Maizapur, Gonda, U.P.
4	M/s Balrampur Chini Mills Ltd., Unit – Babhnan, Gonda, U.P.
5	M/s Balrampur Chini Mills Ltd., Unit – Balrampur, Balrampur, U.P.
6	M/s Shri Bajrang Chemical Distillery LLP, Raipur, Chhatisgarh
7	M/s Dwarikesh Sugar Industries Ltd., Unit – Dwarikesh Nagar, Bijnor, U.P.
8	M/s Magadh Sugar & Energy Ltd., Unit – Hasanpur Sugar, Samastipur, Bihar
9	M/s Dhampur Sugar Mills Ltd., Unit – Dhampur, Bijnor, U.P.
10	M/s Wave Industries Pvt. Ltd., Unit – Bijnor, U.P.
11	M/s Wave Industries Pvt. Ltd., Unit – Saharanpur, Saharanpur, U.P.
12	M/s Triveni Engineering & Industries Ltd., Unit – Sabitgarh, Bulandshahar, U.P.
13	M/s The Panipat Co-operative Sugar Mills Ltd., Rohtak, Panipat, H.R.
14	M/s Pagnism Innovations Pvt. Ltd., Sangli, Maharashtra
15	M/s Bajaj Hindusthan Sugar Ltd., Unit-Khambharkhera, Lakhimpur Kheri, U.P.

16	<i>M/s Yadu Sugar ltd., Distt-Badaun, U.P.</i>
17	<i>M/s Bajaj Hindusthan Sugar Ltd., Unit-Rudhauri, Distt- Basti, U.P.</i>
18	<i>M/s U.P. Cooperative Sugar Factories Federation Ltd., Nanauta, Distt- Saharanpur, U.P.</i>
19	<i>M/s Baghauri Sugar &amp; Distillery Ltd., Distt- Hardoi, U.P.</i>
20	<i>M/s Nanglamal Sugar Complex, Nanglamal, Distt- Meerut, U.P.</i>
21	<i>M/s Simbhaoli Sugar Ltd., Unit-Brijnathpur, Distt- Hapur, U.P.</i>
22	<i>M/s Simbhaoli Sugar Ltd., Unit-Chilwaria, Distt- Bahraich, U.P.</i>
23	<i>M/s DCM Shriram Ltd., Unit-Rupapur, Distt- Hardoi, U.P.</i>
24	<i>M/s Superior Food Grains Pvt. Ltd., Distt- Chandigarh, Haryana</i>
25	<i>M/s PBS Foods (Sugar) Pvt. Ltd., Distt- Bijnor, U.P.</i>
26	<i>M/s Avadh Sugar &amp; Energy Ltd., Unit- Seohara, Distt- Bijnor U.P.</i>
27	<i>M/s Balrampur Chini Mills Ltd., Unit- Gularia, Distt- Lakhimpur Kheri, U.P.</i>
28	<i>M/s Bindals Papers Mills Ltd., Distt- Bijnor, U.P.</i>
29	<i>M/s The Kisan Sahkari Chini Mills Ltd., Nadehi, Distt- Udham Singh Nagar, Uttarakhand</i>
30	<i>M/s Majhauria Sugar Industries Distt- West Champaran, Bihar</i>
31	<i>M/s Dalmia Bharat Sugar &amp; Industries Ltd., Unit – Jawaharpur, Sitapur, U.P.</i>

32	<i>M/s Majhauria Sugar Industries (A unit of Jay Shree Tea &amp; Industries Ltd.), Bihar</i>
33	<i>M/s The Bagpat Co-operative Sugar Mills Ltd., Bagpat, Meerut, U.P.</i>
34	<i>M/s Parle Biscuits Pvt. Ltd., Parsendi, Bahraich, U.P.</i>
35	<i>M/s Anheuser Bush In Bev India Ltd., Meerut, U.P.</i>
36	<i>M/s Renuka Sugars Ltd., Mumbai, Maharashtra</i>

#### ❖ ANALYTICAL SERVICES:

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

<b>Sr. No.</b>	<b>Factory Name</b>
1	<i>M/s Bindals Papers Mills Ltd., Bijnor, U.P.</i>
2	<i>M/s Dhampur Bio-organic Ltd., Dhampur, Bijnor, U.P.</i>
3	<i>M/s Sarjoo Sahkari Chini Mills Ltd., Belrayan, Lakhimpur Kheri, U.P.</i>
4	<i>M/s Dhampur Bio-organic Ltd., Unit – Meerganj, Bareilly, U.P.</i>



5	<i>M/s Dhampur Bio-organic Ltd., Unit – Asmoli, Sambhal, U.P.</i>
6	<i>M/s Dhampur Bio-organic Ltd., Unit – Mansurpur, Muzaffarnagar, U.P.</i>
7	<i>M/s Triveni Engineering &amp; Industries Ltd., Unit – Khatauli, Muzaffarnagar, U.P.</i>
8	<i>M/s Triveni Engineering &amp; Industries Ltd., Unit – Chandanpur, Amroha, U.P.</i>
9	<i>M/s PBS Food Pvt. Ltd., Chandpur, Bijnor, U.P.</i>
10	<i>M/s Wave Industries Pvt. Ltd., Unit – Panni Nagar, Bulandshahar, U.P.</i>
11	<i>M/s Magadh Sugar &amp; Energy Ltd., Unit – Hasanpur Sugar, Samastipur, Bihar</i>
12	<i>M/s Triveni Engineering &amp; Industries Ltd., Unit – Milak Narayanpur, Rampur, U.P.</i>
13	<i>M/s Sahkari Chini Mills Ltd., Nanauta, Sharanpur, U.P.</i>
14	<i>M/s Avadh Sugar &amp; Energy Ltd., Unit – Seohara, Bijnor, U.P.</i>
15	<i>M/s Magadh Sugar Energy Ltd., Unit – Sidhwalia, Gopalganj, Bihar</i>
16	<i>M/s Wave Industries Pvt. Ltd., Unit-Dhanaura Mandi, U.P.</i>
17	<i>M/s Triveni Engineering &amp; Industries Ltd., Unit-Sabitgarh, Distt- Bulandshahar, U.P.</i>
18	<i>M/s Balrampur Chini Mills Ltd., Unit-Balrampur, U.P.</i>
19	<i>M/s Bisalpur Kisan Sahkari Chini Mills Ltd., Pilibhit, U.P.</i>
20	<i>M/s The Kisan Sahkari Chini Mills Ltd., Distillery Unit Sathiaon, Azamgarh, U.P.</i>

21	<i>M/s The Kisan Sahkari Chini Mills Ltd., Distillery Unit Ghosi, Mau, U.P.</i>
22	<i>M/s Wave Industries Pvt Ltd. Unit-Saharanpur, U.P.</i>
23	<i>M/s Zuari Industries Ltd., Unit – Gobind Sugar Mills, Aira, Lakhimpur Kheri, U.P.</i>
24	<i>M/s Ayushi Trading Company, Kanpur Dehat, U.P.</i>
25	<i>M/s Balrampur Chini Mills Ltd., Unit-Tulsipur, Balrampur, U.P.</i>
26	<i>M/s Triveni Engineering &amp; Industries Ltd., Unit-Ramkola, U.P.</i>

#### ❖ **AWARD OF FELLOWSHIP (FNSI):**

1. Fellowship of National Sugar Institute in Sugar Technology awarded to Mr. Mohit Kumar, Senior Technical Assistant (Sugar Technology), National Sugar Institute, Kanpur for developing **“Alternate Clarifying Agents for Cane Juice Clarification”** under the guidance of Director NSI, Kanpur.
2. Fellowship of National Sugar Institute in Sugar Technology awarded to Mr. Rajesh Singh, Dy. General Manager (Innovation & Dev.), Triveni Engineering & Industries Ltd., Khatauli, Muzaffarnagar, U.P. for developing

**"Super Sugar"** containing Spirulina & Basal.



3. Fellowship of National Sugar Institute in Sugar Technology awarded to Mr. Amresh Pratap Singh, Senior Technical Assistant of Sugar Technology, National Sugar Institute, Kanpur for developing the technology of **“Mechanical Clarification of Cane Juice & Process Intermediate Products for Superior Quality of Sugar”** under the guidance of Director NSI, Kanpur.

#### ❖ OTHER HAPPENINGS/ DEVELOPMENTS:

1. National Sugar Institute, Kanpur celebrated New Year function at the institute on 8<sup>th</sup> January 2024, under the auspices of Old Boys' Association of the institute. Prizes distributed to the winners of games, played during the programme.



2. राष्ट्रीय शर्करा संस्थान, कानपुर में विश्व हिंदी दिवस पर एक कार्यशाला का आयोजन "हिंदी भाषा और तकनीकी शिक्षा" विषय पर दिनांक 10 जनवरी 2024 को किया गया जिसका मुख्य बिंदु कृत्रिम बुद्धिमत्ता (आर्टिफिसियल इंटेलिजेंस) के भविष्य में बढ़ते प्रभाव पर केंद्रित था।







3. On the occasion of Makar Sankranti and Pongal, National Sugar Institute, Kanpur demonstrated technologies developed by institute for producing Low GI, Low Calorie, Liquid, Liquid Invert, Fortified, Flavored, other specialty sugars and spreads from sugarcane and sweet sorghum juice. Such demonstration was also made for producing fortified jaggery in different forms and jaggery based products viz. chocolate, cake, cookies and popcorns etc.



4. National Sugar Institute, Kanpur takes up pilot plant trials for preliminary concentration of sugarcane juice up to 22-24 deg. brix by **“Reverse Osmosis”** technique at M/s Dalmia Bharat Sugar Industries, Nigohi, Shajhahanpur, Uttar Pradesh.





5. "**Shriram Madhuryam**", a low calorie, low glycemic index and Vitamin A fortified, liquid sugar developed by the institute produced with minimum use of chemicals was showcased during the month. It may prove to be a much wanted sugar in future.

6. On the occasion of consecration ceremony in the newly built temple of Ramlala at Ayodhya, a program was held on 22<sup>th</sup> January 2024, in the renovated temple "**Dev Dham**" of National Sugar Institute in which officers, employees and students of the institute participated enthusiastically. On this occasion, Ram Darbar was also established in the temple located in the colony of the institute amidst Vedic chanting.



7. "**Boiler Pooja**" was organized at Experimental Sugar Factory (ESF) of the institute on 23<sup>rd</sup> January 2024.

Students will have the opportunity to get hands on training in 100 TCD sugar plant having facility for producing plantation white, raw and refined sugars.



8. The Institute celebrated "**75<sup>th</sup> Republic Day**" on 26<sup>th</sup> January, 2024. On this occasion, Director hoisted the National Flag and took the salute from the security guards. Awards were also distributed to the winners of various competitions organized during "**Swachhta and Satarkata Pakhwadas**".



9. **“Animal Care Unit”** and an **“Animal Welfare Group”** have been established by National Sugar Institute, Kanpur for preventing cruelty to animals and to take care of destitute and helpless one's.



10. Prof. Narendra Mohan, Director, National Sugar Institute, Kanpur conferred **“Excellence Award”**

during the Sugar & Ethanol International Award 2024 held on 01-02 February at New Delhi.



The award has been given in recognition of remarkable achievements and exceptional contribution to sugar & allied industry through development of innovative processes and products.

11. Director, National Sugar Institute, Kanpur addressed the delegates from the sugar industry on the concept **“Bio-refinery-Future of Indian Sugar Industry”** at Bhartiya Sugars, Kolhapur on 10<sup>th</sup> February 2024.





12. Tree plantation, Awareness programme conducted in primary school as well as distribution of personnel hygiene material, Cleanliness drive at local railway station, Creating awareness about plastic pollution as well as distribution of cloth bags in local market and Swachhata Oath administered to staff & students have been taken up during the "Swachhata Pakhwada" during the month of February 2024.



13. An English to Hindi dictionary "**Prayogik Shabdawali**" comprising technical words and terms generally used in sugar, ethanol and allied industry prepared by NSI, Kanpur released on 23<sup>rd</sup> February 2024.





14. Prof. D. Swain assumed charge as Director, National Sugar Institute, Kanpur on 1<sup>st</sup> March 2024. Prof. Swain takes over after the superannuation of Prof. Narendra Mohan.



15. International Women's Day celebrated at National Sugar Institute, Kanpur on 8<sup>th</sup> March, 2024 in which all the women Officers/staff of the institute included girl students participated in the programme.



16. राष्ट्रीय शर्करा संस्थान में दिनांक 18 मार्च 2024 को हिंदी कार्यशाला का आयोजन किया गया। कार्यक्रम के दौरान हिंदी भाषा का अधिक से अधिक प्रयोग करने की सीख दी गई। कार्यशाला में संस्थान में कार्यरत 40 से अधिक तकनीकी अधिकारियों ने भाग लिया।



17. Dr. Ashok Kumar, Assistant Professor (Agriculture Chemistry) and Dr. Lokesh Babar, Junior Scientific Officer (Agriculture Chemistry) attended one day National Seminar on topic "Mechanization of Sugarcane

farming: Operational, Environment and Policy Constraints” on 7<sup>th</sup> March 2024 at Indian Institute of Sugarcane Research, Lucknow, Uttar Pradesh.

18. Director, National Sugar Institute, Kanpur discussed with M/s Advanta Seeds to bring sweet sorghum into the mainstream of ethanol production from non-food source during the meeting at institute on 29<sup>th</sup> March 2024.



19. Educational tour for the students of Post Graduate Diploma Course of Associateship of National Sugar Institute in Sugar Technology (ANSI-ST) - 1<sup>st</sup> Year, was organized to learn the different process technologies at various factories during the month.



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