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कृषि एवं किसान कल्याण मंत्रालय
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
सत्यमेव जयते

National Centre for Cold-chain Development

COLD CHRONICLE

Everything about COLD-CHAIN

PRESERVING FRESHNESS

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EDITORIAL

EDITOR
PRITAM SARKAR
ENGINEER- NCCD

Welcome to the latest edition of the Cold Chronicle. As we continue to explore the evolving landscape of the cold chain sector, this issue brings together key insights, developments, and expert perspectives that underscore the sector's growing importance across industries.

I would like to express my heartfelt gratitude to Mr. Anand Joshi for his invaluable contribution through an insightful case study that highlights real-world applications and innovations in cold chain logistics. His work provides a practical perspective that is sure to resonate with our readers.

We are also honored to feature Dr. Prachi Thakral's expert views on the current scenario of the cold chain in the pharmaceutical sector. Her analysis sheds light on the unique challenges and opportunities in maintaining product integrity, especially in an era where the cold chain is critical to global healthcare solutions.

This edition of the Cold Chronicle is a reflection of the collaborative efforts of industry leaders, thought partners, and innovators, all working towards a shared goal: to strengthen and modernize India's cold chain infrastructure. We are grateful for their contributions and look forward to continued engagement with our readers as we push the boundaries of what this sector can achieve.

You can share your views and ideas.
Mail to: *nccd.india@gmail.com*

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MESSAGE FROM DIRECTOR

SH. PRIYA RANJAN
JS- HORTICULTURE
DIRECTOR- NCCD

It is with great pride that I introduce this edition of the Cold Chronicle on behalf of the National Centre for Cold Chain Development (NCCD) and the Ministry of Agriculture. I have witnessed firsthand the transformative potential of a well-developed cold chain in advancing India's agricultural and horticultural sectors.

The progress featured in this issue highlights the critical role cold chain infrastructure plays in minimizing post-harvest losses and ensuring that fresh produce, dairy, and other perishable commodities reach consumers in optimal condition. Our collective efforts aim to boost farmers' incomes, reduce food wastage, and strengthen our food security systems.

I extend my sincere appreciation to all stakeholders and contributors who continue to work with us in developing and strengthening India's cold chain network. Let us continue to build on this momentum and work towards a sustainable, efficient, and inclusive cold chain ecosystem for the nation.

MESSAGE FROM COO-NCCD

SH. ASHEESH FOTEDAR
COO - NCCD

As the Chief Operating Officer of the National Centre for Cold Chain Development (NCCD), it gives me immense pleasure to present this edition of the Cold Chronicle. The rapid advancements in the cold chain sector have been crucial in addressing key challenges in food security, pharmaceuticals, and perishable goods management. This edition encapsulates the latest events, news, and noteworthy milestones achieved by NCCD and its partners. In recent months, we have seen dynamic growth, collaborative efforts, and innovative solutions that strengthen India's cold chain infrastructure. Our focus has been unwavering: to ensure sustainability, efficiency, and the highest standards of quality in the cold chain ecosystem. This issue also features insightful articles on the latest trends and technological developments in the sector, reflecting our commitment to decarbonization and enhancing energy efficiency.

The strides we are making today are not just about short-term gains but are aimed at creating a resilient future for the cold chain industry, in line with the nation's broader sustainability goals. I extend my gratitude to all our stakeholders for their continued support and collaboration. Together, we are building a robust, sustainable cold chain infrastructure that will benefit industries and communities for generations to come.

WORLD REFRIGERATION DAY 2024

ENERGY EFFICIENT STORAGE: A ROADMAP TO GREEN COLD CHAIN

On June 26th, the National Centre for Cold-chain Development (NCCD), in collaboration with the Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE), celebrated World Refrigeration Day at the prestigious Hotel Pride Plaza in Aerocity. This year's theme, "Energy Efficient Storage: A Roadmap to Green Cold Chain," emphasized the pivotal role that energy-efficient practices play in revolutionizing the cold chain industry.

Event Highlights:

- The theme underscored the significance of adopting energy-efficient storage solutions to develop a sustainable and green cold chain. This is essential for reducing carbon footprints and promoting environmental conservation.
- NCCD played a prominent role in the event, particularly through its active participation in the discussion panel. Experts from various sectors shared their insights on the latest advancements in energy-efficient refrigeration technologies and practices.
- Mr. Pritam Sarkar explained the attendees about the initiatives of NCCD. He explained about the revision process undertaken by NCCD about Minimum Technical Standards and Guidelines to implement cold chain components.

- NCCD emphasized the importance of the Basic Data Sheet (BDS) during the event. The BDS serves as a foundational tool for standardizing and streamlining data collection in the cold chain sector. It facilitates better planning, monitoring, and optimization of cold chain operations, thereby enhancing overall efficiency.
- Mr. Rahul Garjola explained about the proper way to filling Basic Data Sheets while applying for subsidies. He also highlighted the common mistakes done by applicants.
- The event was marked by an array of knowledge-sharing sessions. Industry leaders, researchers, and practitioners presented innovative ideas and best practices in sustainable refrigeration. The discussions ranged from the latest technological developments to policy frameworks that support green initiatives.
- Attendees had the chance to network with peers and industry experts, fostering collaborations that are crucial for driving the cold chain sector towards a more sustainable future.

The celebration of World Refrigeration Day served as a catalyst for change, highlighting the collective effort required to achieve a greener and more energy-efficient cold chain industry. The discussions and ideas exchanged during the event are expected to pave the way for implementing more sustainable practices, thereby contributing to global environmental goals.

The event at Hotel Pride Plaza was a testament to the commitment of NCCD and ISHRAE towards fostering a sustainable future. By prioritizing energy-efficient storage solutions, the cold chain industry can significantly reduce its environmental impact. Together, stakeholders are working towards a future where green practices are the norm, ensuring a healthier planet for future generations.

Together, we're paving the way for a greener, more energy-efficient future!

Food Irradiation

A Modern Tool for Food Safety and Preservation

Food irradiation, a process that involves exposing food to ionizing radiation, has emerged as a valuable tool in ensuring food safety and extending shelf life. By disrupting the DNA of harmful microorganisms, food irradiation can effectively control pathogens, pests, and spoilage. When integrated with cold storage and cold chain practices, it provides a comprehensive approach to preserving food quality and preventing foodborne illnesses.

How Food Irradiation Works?

Food irradiation utilizes high-energy radiation, such as gamma rays or electron beams, to target and destroy microorganisms. This process does not make the food radioactive, but rather disrupts the ability of harmful bacteria, viruses, and parasites to reproduce. The specific dose of radiation required varies depending on the type of food and the desired outcome.

Benefits of Food Irradiation

- *Enhanced Food Safety:* By eliminating pathogens like Salmonella, E. coli, and Listeria, food irradiation can significantly reduce the risk of foodborne illnesses.
- *Extended Shelf Life:* By inhibiting the growth of spoilage-causing microorganisms, food irradiation can extend the shelf life of perishable products, reducing food waste.
- *Improved Quality:* Irradiated food often retains its nutritional value, texture, and flavor better than food preserved by other methods.
- *Reduced Reliance on Chemical Preservatives:* Food irradiation can minimize the need for harmful chemical preservatives, promoting healthier and more natural food products.

The Benefits of Integrating Food Irradiation with Cold Storage and Cold Chain:

Enhanced Food Safety: By combining the microbial control of food irradiation with the temperature control of cold storage, it is possible to achieve a significantly higher level of food safety.

Extended Shelf Life: Food irradiation can extend the shelf life of perishable products, reducing food waste and ensuring a consistent supply of fresh food.

Improved Quality: Irradiated food often retains its nutritional value and sensory qualities better than food preserved by other methods.

Reduced Reliance on Chemical Preservatives: Food irradiation can help to reduce the use of chemical preservatives, which can be harmful to human health and the environment.

Global Trade: Food irradiation can facilitate international trade by ensuring the safety and quality of food products shipped across borders.

Technical Considerations

Radiation Sources: Gamma rays and electron beams are the most commonly used radiation sources for food irradiation.
Dose: The appropriate dose of radiation depends on the type of food, desired effect, and regulatory requirements.
Packaging: Packaging materials must be compatible with irradiation and cold storage conditions to prevent contamination.
Cold Chain Management: Maintaining the cold chain throughout the process is crucial for preserving food quality and safety.

Regulatory Framework

Food irradiation is regulated by various international and national agencies to ensure its safety and effectiveness. These regulations establish guidelines for the use of food irradiation, including permitted dose levels, labeling requirements, and safety assessments.

In conclusion, food irradiation offers a valuable tool for enhancing food safety and extending shelf life. When integrated with cold storage and cold chain practices, it provides a comprehensive approach to preserving food quality and preventing foodborne illnesses. As consumer awareness and acceptance of food irradiation continue to grow, it is likely to play an increasingly important role in the global food supply chain.

ALL INDIA COLD CHAIN SEMINAR

BY FEDERATION OF COLD STORAGE ASSOCIATIONS OF INDIA

HOTEL CLARKS SHIRAZ, AGRA JUNE 15-16

The 17th edition of the All India Cold Chain Seminar & Exhibition (AICCS) was held on 15th and 16th June at Hotel Clarks Shiraz in Agra. The event was a grand convergence of industry professionals, innovators, and key stakeholders, focusing on the latest advancements and trends in the cold chain sector.

The seminar and exhibition served as a platform for networking, collaboration, and learning. Attendees had the opportunity to explore an unmatched showcase of cutting-edge innovations, engage with industry leaders, and gain insights into new market trends. With several exhibitors, the event provided a comprehensive view of the latest technologies and solutions in the cold chain industry.

The exhibition featured over 100 exhibitors from across the globe, presenting their latest products and services. Attendees were introduced to more than 250 innovative solutions that are set to revolutionize the cold chain industry. From advanced refrigeration systems to state-of-the-art cold storage infrastructure, the event was a hub of innovation.

One of the most anticipated aspects of the event was the series of live demonstrations. With more than 75 demos, participants were able to witness the practical applications of the latest technologies in refrigeration and cold chain management. These demonstrations provided valuable insights into how these solutions could be implemented in real-world scenarios.

The event facilitated numerous networking opportunities, allowing participants to connect with industry peers, potential clients, and partners. The collaborative atmosphere fostered by the seminar encouraged the exchange of ideas and best practices, helping to drive the industry forward.

DID YOU KNOW ?

Charles Tellier (29 June 1828 – 19 October 1913) was a pioneering French engineer from Amiens, who made significant contributions to refrigeration technology. Early in his career, he focused on motors and compressed air before turning his attention to refrigeration in 1868.

His work culminated in the development of refrigeration systems for ocean vessels, enabling the preservation of meat and other perishables during transport. In 1911, Tellier was awarded the Joest Prize by the French Institute, and in 1912, he was honored as a Chevalier of the Legion of Honour. He authored Histoire d'une invention moderne, le frigorifique in 1910.

Despite his achievements, Tellier died impoverished in Paris. In 1876, he pioneered the use of dimethyl ether as a refrigerant by installing a methyl-ether refrigeration system on the 690-ton cargo ship Eboe, which he renamed Le Frigorifique. This vessel successfully transported refrigerated meat from Argentina to Europe. However, the system had room for improvement, and in 1877, another ship, the Paraguay, was equipped with an enhanced refrigerating plant designed by Ferdinand Carré, further advancing the technology on the South American shipping route.

COLD CHAIN & LOGISTICS SUMMIT

NAVIGATING THE FUTURE OF COLD CHAIN LOGISTICS

The cold chain sector in India, a critical part of the logistics ecosystem, is poised for substantial growth and innovation in the coming years, according to Dr. Surendra Ahirwar, Joint Secretary of the Ministry of Commerce and Industry's Department for Promotion of Industry and Internal Trade (DPIIT).
During FICCI's Cold Chain and Logistics Summit, Dr. Ahirwar highlighted that the sector currently boasts a turnover of approximately Rs 2 lakh crore and is expanding at a rapid pace of over 10% annually. He stated, "According to one estimate, we are expected to reach a Rs 5 lakh crore turnover, possibly by 2030 or 2032."

Dr. Ahirwar emphasized the importance of various initiatives within the industry, including innovations, infrastructure development, and collaborations between industry and academia. He pointed to advancements such as temperature-controlled warehousing, ice battery technology, and efficient packaging solutions as key developments in the sector.

HOTEL LALIT, NEW DELHI

MAY 29TH

Mr. Asheesh Fotedar, Chief Operating Officer of the National Centre for Coldchain Development (NCCD), Ministry of Agriculture, discussed NCCD's initiatives aimed at enhancing India's cold chain infrastructure, with a focus on sustainability, efficiency, and innovation. NCCD is revising technical standards and minimum guidelines to implement cold-chain components across the sector. These revised guidelines will serve as a roadmap for central and state government bodies establishing cold chain facilities nationwide. Additionally, NCCD is engaging with stakeholders to identify challenges faced by reefer truck owners and is working on policy recommendations for the ministry.

Mr. Amit Kumar, Committee Co-Chairman of the FICCI Committee on Logistics and Director of Pristine Logistics & Infraprojects, underscored the importance of developing sustainable infrastructure and adopting smart technologies to optimize energy use and reduce environmental impact. He stated, "We stand at a pivotal juncture where technology diffusion, policy initiatives, and market demand present unparalleled opportunities for the cold chain sector. By placing sustainability at the forefront, we can mitigate environmental impact, uphold economic viability, and fortify food security."

Additionally, the FICCI-Grant Thornton Bharat Report on “Cold Chain Dynamics: Mapping India's Logistics Transformation” was released during the event. The report highlights India's dynamic food processing industry and underscores the crucial role of the cold chain sector in addressing challenges such as infrastructure gaps and high costs.

Dr. Surendra Ahirwar

An Innovative Upgrade

To Achieve Energy Savings & High Efficiency For Odisha Ice Cream Making Facility

The directive from the owner was to upgrade in phases the existing refrigeration plant for higher efficiency and safety, involving reasonable investment . Many a times plant upgrade / modernization leads to complete change of plant whereby heavy investment and payback estimated at 3 to 4 years are estimated. Hence it was decided that plant improvement be based on green design aiming to achieve highest efficiency and safety management plan. The objective was to keep ROI period less than a year plus achieving minimum 15% energy savings. The refrigerant used for plant is pure Ammonia(earns a high environmental marks with ODP & GWP being Zero) which breaks down to its natural components of nitrogen & hydrogen in a relatively short time. The facilities' refrigerating system is operated thru natural (gravity) flooded feed.

NOTED PREVAILING PROBLEMS

A systematic study was made to accordingly implement the above . The primary step was to prepare a HAZOP report and investigate operational plant problems on day to day basis. We proceeded by recording plant operation parameters and operating hours. After careful study, following problems were observed in the existing refrigerating system:

1. The chiller rooms and freezer rooms are not able to achieve desired temperature in spite of long running hours of compressors.
2. All unit compressors including standby were required to remain in operation in order to meet the required refrigeration capacity.
3. The compressors were running full load at all times.
4. The compressor suction pressure and plant evaporating temperatures did not correlate. The suction pressure was much lower than the corresponding room temperature.
5. The compressor discharge pressure was high considering the ambient conditions.
6. Complete plant had to be operated manually.
7. The air cooler coils for chiller (cold) rooms and freezer rooms were frosted.
8. Although the cold room and freezer rooms were designed at - 25°C room temperature , however the best temperature achieved would be below -14°C.
9. The defrosting system was manual and was never able to defrost the coils completely.
10. Plenty of oil was getting accumulated in ACU/ Freezer coils.
11. Plant safety management was non-existent.
12. The level control system was bypassed and operators were manually throttling the valves on receiver supply line.
13. Freezer air cooler coils were starved for liquid supply ,but operators were afraid of liquid surge to compressor.
14. Operators were kept occupied by operating various valves and using all efforts to check operation, temperature and liquid level.
15. Due to small leakages through flange joints , strong ammonia odor was continuously felt in the machine room.
16. The chiller rooms and freezer rooms were located around the plant and many times the loader would be trapped in the room, thus preventing the trapped person to freely communicate with plant operators.

ENERGY-EFFICIENT MEASURES& NOVEL SOLUTIONS

Above conditions lead to high energy consumption and loss of production while overall plant was unable to perform at designated requirements. Also considering that the allocated budget to rectify the above was quite limited and in view of time constrain, we decided to concentrate on achieving desired room temperature, increase plant efficiency and improve plant safety at shortest period of time. Another constraint faced was limited job site availability of highly skilled and certified man power to operate the plant. Hence it was required to provide an automatic operating system which can be easily handled by professional plant operators .

The following functions were performed to update plant operation, smoothly and trouble-free:

1. Installed dual Safety (relief)Valves on all pressure vessels with required pressure ratings.
2. Calibrated compressor safety cut out , repaired and reconnected for safety.
3. Installed (on each compressor) easy to use Automatic Compressor control system with energy monitoring.
4. Installed fully automatic air purger on condenser and liquid receiver circuit.
5. Installed automatic hot gas defrosting system (replacing the existing manual defrost) on all air cooling units in chiller rooms and freezer rooms.
6. Installed temperature monitoring and control devices for all cold rooms and freezer rooms.
7. The automatic level control system was serviced and put into use.
8. Installed the reflex type level gauges and removed the glass tube one.
9. Installed an integrated automatic ammonia leak detection system.
10. Replaced all flange type valves were replaced with 40 bar weld in-line valves. The valves were chosen with back seating facility.
11. The chiller room alarm system with built-in battery back-up was installed on machine room doors for trapped loader and generate alarm in plant room. This unit was incorporated with inbuilt battery backup so that it can work independently in the event of power outage.
12. The overall above system improvement is anticipated to provide a Low Life Cycle Analysis (LLCA) and low carbon emissions where the refrigerating system gets greener and the energy savings add to the bottom line footprints.

Ammonia Leak detection system

Cold Room Safety

Plant piping after modification

Plant discharge pressure before plant modification

Plant discharge pressure after plant modification

Fully automatic air purger in operation

Easy to use compressor automation system

Data monitoring system with webbased operation and mobile application to monitor plant performance online anywhere in world

Plant piping before modification

Automatic liquid level control, temperature control and hot gas defrosting system

Above performance was successfully implemented within 10 working days. This was done together with the valuable assistance of plant operators and one certified welder, without any downtime or disturbing status quo of plant operations. Once the required changes was in place and analysis performed against baseline and prevailing industry standards, the positive results achieved on the same was evaluated as follows:

1. The compressor discharge pressure reduced significantly to 160 PSI from 220 PSI.
2. The automatic operation of compressor units removed operator interference and resulted in smooth loading / unloading of each compressor. Additionally overall energy requirement for compressor was reduced significantly.
3. The safety valves and release system ensured increased safety at plant and no discharge of ammonia in plant incase safety valve pops up.
4. The automatic ammonia leak detection and alarm system increased plant safety meeting OSHA's PSM requirements extending operator flexibility in working around the plant.
5. The automatic hot gas defrost system replaced manual defrost operation.
6. The defrost time was reduced to 15 minutes instead of 45 minutes.

7. The increase in cold room / freezer room temperature during defrost reduced to 2°C from 10°C.
8. The cold room / freezer room design temperature of -25°C was sucessfully achieved.
9. The time required for freezer operation reduced 25%.
10. The number of compressors required reduced. The standby compressor remain as standby, was never required to operate.
11. Reducing compressor running hours by 25%.
12. The automatic level control system made sure that ACU/Freezer coils are flooded thus preventing liquid slopover to the compressor.
13. The automatic level control system avoided operator's interference by throttling valves on receiver supply line.
14. Oil accumulation in ACU and freezer units was eliminated.
15. Frosting on ACU & freezer units eliminated.
16. The online data logging and remote monitoring system installed helped customer to monitor the plant on mobile phone while travelling abroad and enjoy his holidays.
17. The temperature control system made sure that required temperatures are maintained continuously. No under shooting / overshooting observed. All temperature were maintained within ±2°C.
18. The weld in lines valves eliminated the leakages through flange joints of the valves.
19. The back seating facility in the valve assured operators that now they don't have to pursue in tightening valve glands.

LOOKING AHEAD:
Thus, over all plant performance improved by:
1. Reducing the plant operation time.
2. Improving plant temperature.
3. Operating at optimum suction and discharge pressure.
4. The ammonia odor from plant room vanished.
5. Increased plant safety and performance.
6. The automation of compressor, defrost system, liquid level control and plant monitoring allowed operators address other maintenance issues.

After observing a trouble-free plant operation for a period of one year, anestimated30% energy saving was derived with an overall payback recovered within 4 months. Additionally it also improved product (ice cream) quality and production capacity as compared to (prior to above improvement) previous year.

Author: Mr. Anand Joshi

This is a case study on improving plant efficiency and safety of Ammonia Refrigeration System at a modern technology Ice Cream manufacturing unit. The plant is located at Cuttack near Bhubaneshwar, Odisha. The production capacity of the facility is 10 MT of ice-cream every day for meeting the market requirements of Odisha and the neighboring
states.

COLD STORAGE AND TRANSPORT OF MICROORGANISMS OR CELLS FOR CELL CULTURING AND RESEARCH

The global distribution of disease burden has changed dramatically over the past three decades, with a notable rise in both emerging and re-emerging diseases. Many reasons, such as the increase in global surface temperatures and the increased melting of the permafrost, might be blamed for this escalation. The distribution and frequency of diseases have been significantly impacted by these changes in the environment. As a result, there is an urgent and growing need for new diagnostic procedures and research to understand the complexity of microbial life. In order to meet this, advancements in the technology for biological sample storage and transportation are also required, in addition to the efficient diagnostic instruments.

One important step in the diagnostic process is the transportation of biological samples. Pathogens must be transported while maintaining their biological integrity in order to produce a diagnosis that is both accurate and trustworthy. As viruses are more prone to inactivation and degradation than other microbes, preservation is especially important for these kinds of microorganisms. Temperature-sensitive transport mechanisms are needed to keep these microorganisms viable for study and diagnostic applications. Unfortunately, even though sample transport media are available in India, many of these systems are not equipped to operate at room temperature. The integrity of the samples is frequently compromised by this insufficiency, which causes microorganisms to reactivate or deteriorate.

The transportation of microbiological specimens around India has faced significant obstacles. These difficulties include:
(1) maintaining a cold atmosphere consistently throughout the transportation process;
(2) handling infectious specimens with biosafety concerns;
(3) the high risk of leakage during transportation;
(4) the scarcity of trained personnel able to ensure proper packaging and handling to maintain specimen viability;
(5) the possibility of cold chain equipment malfunctioning;
(6) inefficiencies in logistics and contingency planning; and
(7) inadequate warehouse and storage facilities within the nation.

Microbial specimen storage and transportation involves a number of concerns, including the possibility of leaks that could provide serious biohazards. To mitigate these hazards, advanced technologies such as electronic refrigerators with temperature sensors and environmental warnings should be used. Similar systems have previously been implemented in other nations, including the United Kingdom. These systems send alerts if specimens are contaminated, positioning systems fail or if the deviations from the designated routes occur. By alerting concerned laboratories and staff about any problems, early containment and intervention could be facilitated by using such technologies in India.
The necessity of keeping proper temperatures during transportation cannot be overlooked. Establishing a cold chain system is among the most effective ways to guarantee that microorganisms are maintained at constant, ideal temperatures during transit. On the other hand, the COVID-19 pandemic has brought to light serious shortcomings in the current supply chain infrastructure. The increased demand for molecular research to comprehend various disease strains revealed inadequacies in the infrastructure and procedures for sample storage and transportation. Although the Indian Council of Medical Research (ICMR) has established guidelines for the collection, packaging, and transportation of high-risk pathogens,

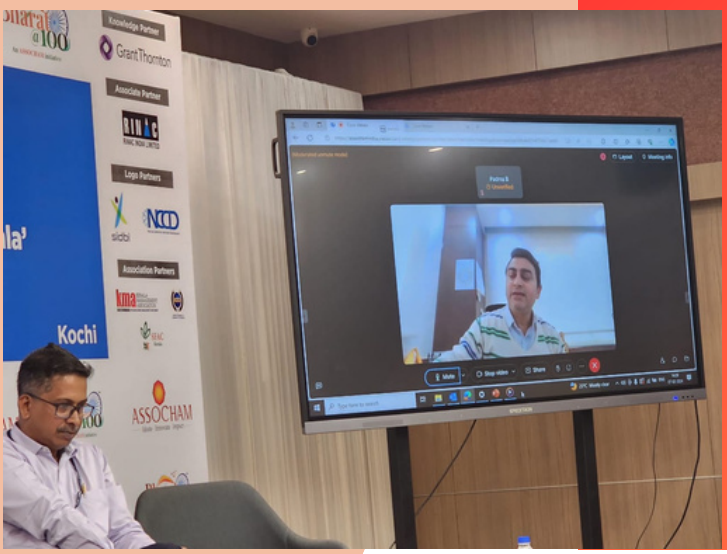
including a triple packaging system, implementing and maintaining these standards is a difficult task in a country as large, diverse, and populous as India.

- Furthermore, India's increasing digital penetration provides up new avenues for inventive solutions. The government could develop a specific app for use by medical laboratories, transportation businesses, and storage facilities. This tool could help assess sample package quality and identify if any further precautions should be taken before samples are received. Pre-existing applications, like the BIO HAZ MAT app in the US, provide extensive instructions for tracking, labelling, packing, and marking infected items. The effectiveness and security of specimen delivery might be substantially improved by a comparable app designed for the Indian environment.
- Another viable alternative is to implement devices like to vaccine vial meters (VVMs)), which are employed to keep track on the vitality of vaccinations. These meters could be modified for use with infectious samples, giving a visual cue through colour changes of exposure to extreme heat or loss of viability. With the help of these technologies, compromised samples could be recognized even by unskilled workers in remote places, guaranteeing that only viable specimens are used for study and diagnosis.
- Additionally, thorough government guidelines for the safe transportation of infected specimens must be developed and put into effect immediately. By standardizing procedures across the nation, these rules would resolve inconsistencies and improve overall safety and dependability in the transportation process. The growing number of research institutes in India offers a chance to provide medical laboratory staff with in-depth training. These courses would increase their proficiency with handling and moving specimens, which would lower the dangers involved with these procedures.
- To effectively handle these challenges, it would be beneficial to integrate and adapt successful approaches from other industries, such as health care and food production. For example, district-level establishment of specialized temperature-controlled warehouses might greatly improve the effectiveness of road transit for specimens. Before samples are transferred to their final locations, these warehouses could act as intermediate storage locations where they are stored in ideal circumstances. Using infrared thermometers to periodically check the temperature of the specimens once they arrive at these warehouses could assist detect and filter out any compromised or contaminated samples early on, avoiding possible problems from getting worse.

In conclusion, a diversified strategy is needed to solve the issues pertaining to the storage and transportation of microbiological specimens in India. It is possible to increase the efficacy, safety, and efficiency of specimen transport and storage by utilizing cutting-edge technologies, enacting strict government regulations, and replicating successful practices from other industries. In the end, these steps will improve public health outcomes and improve the management of emerging and re-emerging diseases by ensuring that biological samples are viable and trustworthy for research and diagnostic uses.

Author: Dr. Prachi Thakral

Dr. Prachi Thakral, a Dental Graduate from ESIC Dental College and Hospital, New Delhi, is currently pursuing a Post Graduate Diploma in Hospital and Health Management from IIHMR, Delhi. Born and raised in Delhi, she believes good health starts at the community level, driving her passion for public health. With a vivid imagination and strong research skills, she excels in structured thinking and is eager to create positive change in society. Adaptable and quick to learn, she is committed to making a meaningful impact in healthcare.



CONFERENCE ON COLD CHAIN

DEVELOPING COLD CHAIN ECOSYSTEM IN THE STATE OF KERALA

The ASSOCHAM Kerala State Development Council, in collaboration with Grant Thornton Bharat LLP, successfully organized a one-day conference titled "Developing Cold Chain Ecosystem in the State of Kerala" on Wednesday, February 7, 2024, at the Kerala Management Association in Kochi. The event addressed the critical role of cold chain infrastructure in reducing food wastage, a pressing global issue highlighted by the FAO, which reports that one-third of food produced for human consumption is wasted.

Sh. Asheesh Fotedar, COO of the National Centre for Cold Chain Development (NCCD), attended the conference virtually and emphasized the importance of developing the cold chain sector. He highlighted the active role NCCD is playing in this direction. The conference featured panel discussions on several key themes, including state-level best practices and policies for cold chain development, enabling schemes from the Government of India, advancements in cold chain technologies, and credit facilities for cold chain infrastructure and value chain financing. The Government of Kerala's initiatives and incentives to promote cold chain development, including research in this area, were also focal points of the discussions.

KMA HOUSE, KOCHI

FEB 7TH

2ND AGRO SUMMIT

TRANSFORMING AGRO-FOOD SYSTEMS FOR GREENER FUTURE

The session emphasized the critical role of cold storage solutions in maintaining the quality and safety of perishable goods. Effective cold storage can reduce food wastage and ensure a steady supply of fresh produce. Discussions also focused on sustainable practices and technologies in cold storage to minimize environmental impact, including innovations in energy-efficient refrigeration systems and their implementation in the agro-food sector.

Challenges faced by the cold storage industry, such as infrastructure gaps and high energy costs, were addressed. Opportunities for growth and improvement, including government support and private sector investment, were explored. Insights into current policies and regulations governing cold storage in India were provided, along with recommendations for policy enhancements to support the growth of a sustainable cold chain infrastructure.

Successful case studies demonstrated the benefits of advanced cold storage solutions, and best practices from global and local perspectives were shared to enhance the efficiency and sustainability of cold chains. The importance of collaboration between government bodies, the private sector, and international organizations was highlighted, along with the potential for public-private partnerships to drive innovation and investment in the cold storage sector.

This session underscored the necessity of integrating advanced cold storage solutions to ensure the quality and sustainability of agro-food supply chains, emphasizing a collaborative approach to overcome challenges and leverage opportunities for a greener future.

VIRTUAL MODE

JUNE 19TH

कृषि एवं किसान कल्याण मंत्रालय
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