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INDIAN DAIRYMAN

THE SPIRIT OF THE DAIRY INDUSTRY

₹ 150 April 2018

Conference Special Part-2

Dr. Kurien Memorial Oration Lecture:
By Dr. D Babu Paul

Technical Presentations

Recommendations of 46th DIC

PERSPECTIVE
Developing Institutional Mechanism to Ensure All time Remunerative Milk Prices to the Dairy Farmers

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Spreading Healthy Smile - Globally

THE SPIRIT OF THE INDIAN DAIRY INDUSTRY

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INDIAN DAIRYMAN is a specialist monthly magazine dedicated to the dissemination of the latest information, innovations and ideas on the dairy industry so that major players in this field are kept up-to-date. In this way, it acts as a communicator to the dairy industry.

The objective is to provide information service on research, developments and management - crucial factors that affect the dairy industry in the country. The editorial blends essential elements with practical advice to present a comprehensive outlook on all aspects of the industry. The periodical is, thus, a mouthpiece of the Indian Dairy Industry - by you, for you, and of you.

The periodical has become a reference point for anyone attached to this mushrooming industry and is the right medium to reach a focussed audience.

CONFERENCE SPECIAL (PART - 2)

ARTICLE ON CURRENT ISSUE

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From the President's Desk

> **"The production incentives for boosting milk production may be given in the form of subsidized concentrate feeds, TMR, enriched wheat and paddy straw, mineral mixtures, supply of veterinary drugs, animal health insurance and uninterrupted supply of credit facility at low interest through Kisan credit cards."**

Dairying is an important activity for Indian farmers to supplement their agricultural income. India accounts for nearly 30.5 per cent of the global bovine population. The country also tops in world milk output with an estimated 165.4 million tones milk production in 2016-17. Ironically, the lactation yield of Indian cows is about 1500 kg as against the world average of 2200 kg and much below the USA (9315 kg) and 10035 kg of Israel. Such a low yield in cows is mainly due to poor genetics, shortage of feeds and fodders and limited veterinary care. Maintenance of dairy animals is becoming quite expensive and uneconomical. At present, over 80 per cent of dairy animals are owned by 75 million small and marginal farmers. With two to three animals, farmers produce on an average five litres of milk daily embracing critical portion of dairy industry.

Milk components are the main source of high grade nutrients in the vegetarian diets. Milk supports the economic development of farm families and improves their quality of life. Dairying is at present facing numerous challenges like low prices of milk paid to farmers and accumulation of surplus milk solids due to prevailing low international prices for milk powders and butter. This is adversely impacting the welfare of hard working dairy farmers. Besides, low genetic potential of dairy animals, insufficient feed and fodder resources, shrinking land usages for fodder cultivation and deepening of water tables are affecting milk production.

High prices of compounded animal feeds, concentrates and oil cakes laden with high taxes on other inputs discourage farmers to feed their animals well the animals leading to low milk production. Slowly the milk producing capacity of the animals will get decreased in the absence of adequate supply of essential nutrients. Consequently, the health of animals will also get affected and the farmers will not be able to exploit the genetic potential of low-fed animals in future shattering our planning for increasing milk production.

Dairy development policies framed by the Animal Husbandry department must lay emphasis on "technology-driven dairying" rather than "animal population-driven dairying". In view of the shortage of feed and fodders, there is a strong need for using modern technologies such as the use of sexed semen and artificial insemination techniques in the indigenous cattle and buffaloes to increase the number of elite females at farmers' fields. Mass estrus synchronization using CIDR-GmRH protocol is a

good initiative adopted by Bengaluru based dairy scientists and farmers. Technologies of multiple ovulation and embryo transfer should be promoted for faster multiplication of superior germ plasm.

The production incentives for boosting milk production may be given in the form of subsidized concentrate feeds, TMR, enriched wheat and paddy straw, mineral mixtures, supply of veterinary drugs, animal health insurance and uninterrupted supply of credit facility at low interest through Kisan credit cards. These concessions are expected to reduce the cost of milk production and increase the farmers' income.

Demand for milk and milk products is growing in the domestic as well as overseas markets of Asia, Latin America and African countries mainly triggered by increasing human population, higher disposable incomes and increased health awareness about the nutritional superiority of milk constituents. Although, India is the world's largest milk producer and has the largest dairy herd, its share in global trade for milk and milk products is less than one per cent. There is a need for us to find out future opportunities in the world market considering the milk demand and supply in the above mentioned countries. Investments in such a market study will greatly benefit the potential dairy exporters and milk producers of India.

The recommendations that emerged during the 46th Dairy Industry Conference are being published in the current issue of *Indian Dairyman*. It is hoped that the worthy readers will find them useful for planning a robust dairy development in India.

(G.S. Rajorhia)

Dr kurien memorial oration lecture

Address

By

Dr. D.Babu Paul, IAS (Retd.)

Former Additional Chief Secretary, Govt. of Kerala

President-IDA, brothers and sisters, Let me, first of all, thank Dr. R. Rajendra Kumar for all the good things he said about me. I made my first public speech when I was five and a half years old, mugging up what my teachers told me. And, now I am 77 years old. When I completed 17 years as a public speaker, a prominent Malayalam newspaper made a rough calculation and put the number of speeches made by me at over 7000.

These days I accept invitations for delivering speeches more to ensure that I will hear things which I would not be able to hear when delivered at my funeral. Because the words, spoken when somebody is being given the final farewell, are exaggerations.

I am happy to be in the midst of a large number of professionals. I am particularly happy to see my old classmate Dr. Sosamma who studied with me in the 1950s. Dr. Sosamma discovered for the world the Vechur cow which would have gone extinct but for her endurance. She has travelled here, of course, to meet all of you but also to meet me. I am touched by this gesture.

Now, let me welcome all the guests from outside Kerala to this State. We call it God's Own Country. That is a catch phrase lifted by a copywriter from a 19th century poet. It was first used by New Zealand without success at the beginning of the 20th century to invite migrants to come to and settle down in New Zealand.

Our ad agency had a brilliant copywriter, Walter Mendis. He passed away recently. May his soul rest in peace! He suggested that we use this expression to promote Kerala. The State was then under the Communist regime as it is even now. And, we took this suggestion to the Minister in charge of Tourism, Mr. P.S. Sreenivasan. He was a great Communist but also had a great sense of humour. So, he said, "You want me, a Communist, to admit that God exists by saying that this is God's Own Country." But, the phrase clicked and as a first Tourism Secretary of Kerala, I am happy to see that the expression God's Own Country has become a synonym for Kerala. My successors over the last four decades have done a better job than what I did in 1989 to improve tourism in this State. Tourism voyages in Kerala have crossed the critical barrier, and now even the sky is not a limit for that.

Kerala is a beautiful country. It is also a place of paradoxes. It's a place where a space scientist and an astro-palmist co-exist. We in India launch satellites, but the time for the launch is generally prescribed by our astrologers, and you will find this in Kerala. The other

day I went to see an astrologer and just as I entered his office, the person who was coming out-I will not mention his name-is now a renowned space scientist. So this is part of our culture.

Kerala is a place where succession was matrilineal, property got transferred from one generation to the next through the daughter, not the son. But women were still controlled by men except that it was not the husband but her older brother who controlled her. This is the other paradox.

The first woman surgeon general of India, the first woman IAS officer, the first woman high court judge in the British Commonwealth, the first woman judge of India's Supreme Court – they all came from Kerala where ironically even today the marriage of a daughter is still a burden because of dowry and emphasis on gold ornaments.

Kerala is also a place with history. Legend takes us to Lord Parshuraman and Emperor Mahabali. History also proves Kerala's trade with foreign countries, and this contact has been there from the days of King Solomon more than 3000 years ago. Around the beginning of the first millennium of the Common Era, that is BCE 100 to CE 100, we had a flourishing port and international maritime trade.

Christianity came to Kerala before it reached Europe. Before Paul crossed over to Macedonia, Thomas had crossed over to India. Islam was here before Turks became Muslims because within 20 years of the Prophet's ascension, the first Muslim place of worship in the Indian subcontinent was built in Kerala. I recall a saying that Kerala is a place on earth worth visiting.

Let me now salute Dr. V. Kurien, Padma Vibhushan, and Father of India's White Revolution. As a Keralite and as an engineer, I derive a special satisfaction in honouring the memory of this great son of India. I was hoping that around the last Republic Day we would hear the good news that Dr. Kurien was declared a Bharat Ratna. I hope it is done at least now. I am sure that the dynamic Prime Minister, Mr. Narendra Modi, with a Gujarat background would make it a point to ensure that Dr. V. Kurien, Padma Vibhushan, is declared a **Bharat Ratna**.

It was Dr. Kurien's good fortune that he exited Kerala in good time and escaped the Kerala crab syndrome. This syndrome is something which I heard about 40 years ago. Once from the Cochin port, live crabs were being exported. The foreign buyer came to inspect the product and the process. He found that live crabs were kept in containers without a roof. There was nothing to cover the container. So, the European gentleman said, "How can you allow this? The crabs will crawl all over the place, and this arrangement is also unhygienic". The Indian exporter replied, "Don't worry about the crawling part. These are Kerala crabs. If one crab tries to climb, all the other crabs will bring him down." This is Kerala crab syndrome. God be praised that Dr. Kurien did not have his career in Kerala.

The late Archbishop of Trivandrum Benedict Gregorios was a great man. He was like our old Indian sages in his habits. He had a great interest in rural development and various things just like a concerned community leader. So, he requested Dr. Kurien to come to Kerala and repeat what he has done in Anand. But Dr. Kurien told the Archbishop, "Your Grace, that's not possible because there are too many Malayalis in Kerala."

So, we are a good people. One Malayali makes a good worker. Two Malayalis would form an association. Three Malayalis would begin the first strike. Four Malayalis would split themselves into two associations. This is why I said that Dr. Kurien exited Kerala in good time.

Dr. Kurien was a great motivating example for those of us who worked for society in Kerala. The two most significant areas of success in this State are cooperatives and dairy. I have no doubt that the example of a great son of Kerala, Dr. Kurien, provided the inspiration for the latter and models for development of the former. The model that he developed helped us have a strong cooperative sector and the inspiration that he provided led our dairy industry forward.

Dr. Kurien was a visionary who could transform a challenge into an opportunity. An ordinary mortal would have run away from a seemingly frustrating environment in Gujarat when he first went there, but not Dr. Kurien. The greatest tribute to Dr. Kurien is that while numerous attractive models of rural development failed in this country, the Kurien model not only survived but also set the pattern for continued improvement. He is a great man who achieves great things, but he is a greater man who leaves an example for subsequent generations to build on what he has made and work on the principles he has learnt and take it forward. However, such people are very few.

Dr kurien memorial oration lecture

My father used to tell me when I was young that history is an impartial but a very cruel judge. During Emergency, I was a district collector. At that time he told me that 500 years from now Jawaharlal would merit a page in history and Indira Gandhi would be just another name in history. You tell me history of Indira. How many people will know her?

During its journey from ancient history to modern history, India has seen great personalities such as Emperor Ashoka, Adi Shankara, Vivekananda, Ramakrishna Paramahansa and Mahatma Gandhi. History produces only very few people who survive the test of time. And, Dr. Kurien is one such great personality. Not only for what he has done during his life but also for the models he left behind, the examples he left behind, and the inspiration that he continues to give to later generations of people.

It is one thing to achieve something. All of us, smaller or larger in our roles, would have achieved something, but people like Mahatma Gandhi, people like Adi Shankara, people like Swami Vivekananda, people like the great engineer Visvesvaraya and people like Dr. Kurien leave a trail which cannot be wiped away. History will be marked by them rather than their being acknowledged by history. That is the greatness of Dr. Kurien.

It is not a small thing to be called the Architect of White Revolution in a huge subcontinent like India. Nor is it a small thing for an individual engineer, fighting against circumstances in his young age to be called the Milkman of India and that is Dr. Kurien.

To honour the memory of the Milk Man, we must continue to maintain our position as the world's largest producer of milk. That position we have achieved surpassing the USA whom we beat a couple of years ago. Alongside, we must concentrate on further genetic improvement of our livestock, simultaneously ensuring protection of our native varieties.

Supply and distribution of milk must meet international standards in efficiency. Quality has to be ensured just as we pursue higher quantities. This means that we should have a multi player approach. Of course, we have a very successful and time-tested cooperative sector. But we must acknowledge that the government sector and private sector as equally important. We need the government sector because huge expenditures would be necessary for continuous upgradation of quality management and effective monitoring of the public good. We need the private sector, particularly the foreign private sector, to ensure that we are not insulated from the trends that manifest from time to time on the world scene.

In this context I recall the success of the national project for cattle and buffalo breeding initiated just about the time I was leaving the service at the turn of the century. I understand that by the end of the decade in 2010, the semen production doubled, the number of inseminations increased from 22 million to 48 million or so. The rate of successful conception improved from 20% to 35%. We should now take this forward. While doing so we must ensure the role of the small holders in dairy and livestock production. We must also encourage small-scale producers in our villages. We must encourage women to come to this field more and more. If they participate more dynamically in this sector, it would contribute not only to their own empowerment but also to better equilibrium in the rural society in this country.

It goes without saying that productivity has to improve continuously to ensure higher quantities in an efficient manner and hold our current competitive levels vis-à-vis major producers like the United States. An important component in this endeavour is the augmentation of feed and fodder resources. Environmental issues become significant here both in the production of feed and propagation of fodder cultivation. Parallel to all this, we must expand our capacity to handle milk in areas of production, processing and logistics to ensure food safety. To take technology to the doorsteps of the farmer we need both awareness and extension.

Also, control of communicable diseases is good but their eradication is important. While I was researching for today's talk, I felt sad to know that the foot and mouth disease is still a major problem. However, I am sure the government's allocation of ₹ 7000 crores would help us control this in future.

We need to target higher production for the next five-year period. For this, the productivity has to improve; infrastructure has to improve to ensure more effective procurement, more efficient processes, and more economic market. We must remember that nearly 70% of the product cost is accounted for by the field. This means that to ensure higher levels of efficiency in productivity, we need to enrich food and also ensure the cost economics.

What Dr. Kurien has achieved has to be replicated in a more glorious manner. That is what we can do to

honour his memory. We need a second White Revolution and we need it in a shorter span of time than the first White Revolution. For this, we have to ensure increased per animal productivity and enhance handling in the organized sector. We must empower ourselves to face international competition as well as domestic competition from imports and possible foreign direct investment. This is where I think change from sufficiency to efficiency becomes particularly significant. I am sure that under the dynamic guidance of the charismatic Prime Minister who hails from the land of Amul, this great country will achieve the targets in this field.

Honouring a person and his memory at an annual event is hardly sufficient. We are a society which has abbreviated Mahatma Gandhi as a mere MG. Every city has an MG Road, but we do not remember what MG stands for. We remember Mahatma Gandhi on two days every, January 30 and October 2. Then we remember him as a familiar face on our high value notes. That should not be the plight of Dr. Kurien, even after those who worked with him leave the scene.

Many of us have seen Dr. Kurien. Many of us like Dr. R.P. Aneja have worked with him. Our memories are fresh and the inspiration is yet imaginable. But you should think of your grandchildren. For the third generation from now who will work in the dairy industry in this country, Dr. Kurien should not enter as a mere VK like Mahatma Gandhi has been reduced to a mere MG. And, it is for you to ensure that the basic principles which Dr. Kurien established are understood and translated vis-à-vis the changing times.

I hold that following Jesus Christ does not mean that literally following all the verses in the Bible. He has established certain truths; he has taught certain lessons. But he lived 2000 years ago. True, we call him Son of God, and all that. Those things have to be interpreted to suit the situation in this country at this point of time or any country or any point of time. This applies to all great souls. It also applies in a different manner in the opposite direction. Swami Vivekananda quoted Katha Upanishad and said, "Uttisthata Jagrata Prapya Varannibodhata…" (Arise, awake, and stop not till the goal is reached). He said this to the entire Indian youth of his time, but you will notice that nowadays people are trying to narrow his vision. This happens to every religious leader, every social revolutionary. It should not happen to Dr. Kurien.

Let us remember what Dr. Kurien did in Gujarat was a response to the situation there, but in doing that he established certain guidelines for you such as the significance of democracy, the significance of the cooperative sector, the significance of women empowerment, the significance of quality assurance. I'm sure that you will be able to list out more from what from Dr. Kurien has left. Those are the values that should survive through generations and that will be the tribute to Dr. Kurien. And, that will ensure a more glorious future for the dairy industry in this great country where we worship cow. This is perhaps the only country in the world where the Constitution says that a cow should be respected.

Our ancient sages spoke highly of the cow. The most popular God form in our country is Krishna. And, who was Krishna? He was a cowherd. And all the stories connected with him are all related to dairy products. So, this is all part of our tradition. This is part of our culture. This is part of our heritage. That should inspire us. So, respect for the cow is part of our culture, part of the religion of the most people in this country, part of our Constitution, and part of our ethos. Respectability of the cow and the cow's world including all the other cattle should be underlined. That is what Dr. Kurien did. He related this eternal source of Kamdhenu to the average man's day-to-day life.

Let us remember the principles underlying the activities undertaken by Kurien. It is one thing to be impressed by what he did, it is another thing to learn the lessons he has taught for future generations in his life and work. Our job is to understand the latter, to understand what he stood for, that is, the basic principles which motivated you. The methods he used may be deemed out of ditch tomorrow, if not today. But the principles he underlined, the glorious concepts that he highlighted, they are eternal and they will not be eclipsed by the passage of time. If you remember that, that will the greatest honour that we can offer to Dr. Kurien's memory.

May Dr. Kurien's soul rest in peace and may he continue to inspire all of us in this country not only those in the dairy field but also all those who are interested in the welfare of the masses of this country and in the success of the future of this country!

Salute to Dr. Kurien and gratitude to all of you! Thank you very much! God bless! Jai Hind!

Write, Inspire, Educate !!

Indian Dairyman is a magazine that prides itself on the dissemination and sharing of knowledge and information related to the dairy world. Often this has proved a source of inspiration for many. We call upon authors and readers to contribute whole-heartedly to this magazine. Outstanding success stories in the world of dairying and case studies from various parts of the country would serve to educate and inform the entire dairy community and will be much appreciated.

Well-researched articles and features which are of interest to the layman and the general reader by providing information related to dairying are also welcome.

It has been decided by the management of IDA that from July 2017 a remuneration of ₹ 1000/- will be paid for each article published in *Indian Dairyman*. The cheque will be sent to the first author of the article in case there is more than one author. It is his/her responsibility to ensure that the amount is distributed equally amongst all authors.

We thank our readers and contributors for their esteemed patronage to the magazine and look forward to continued association in the future.

All contributions may be sent to:

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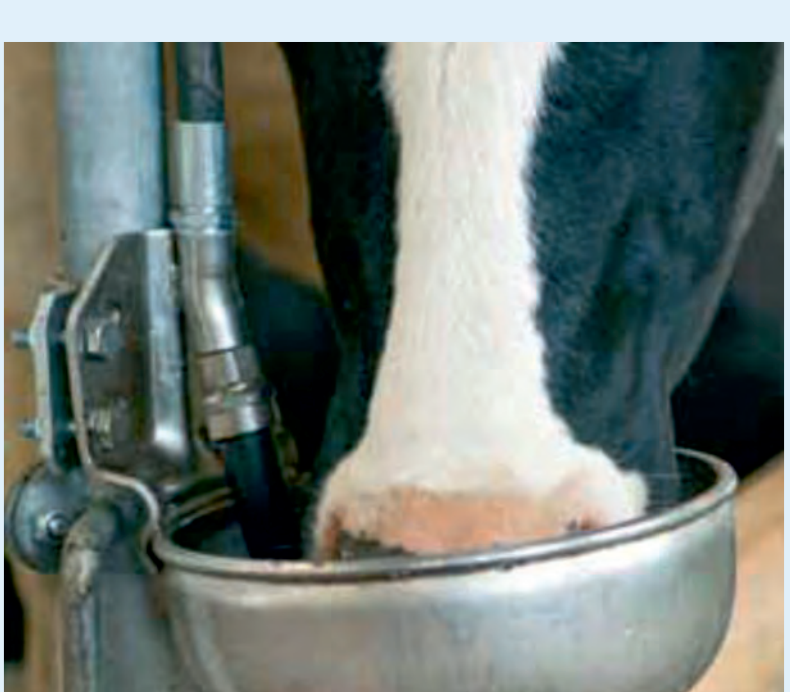

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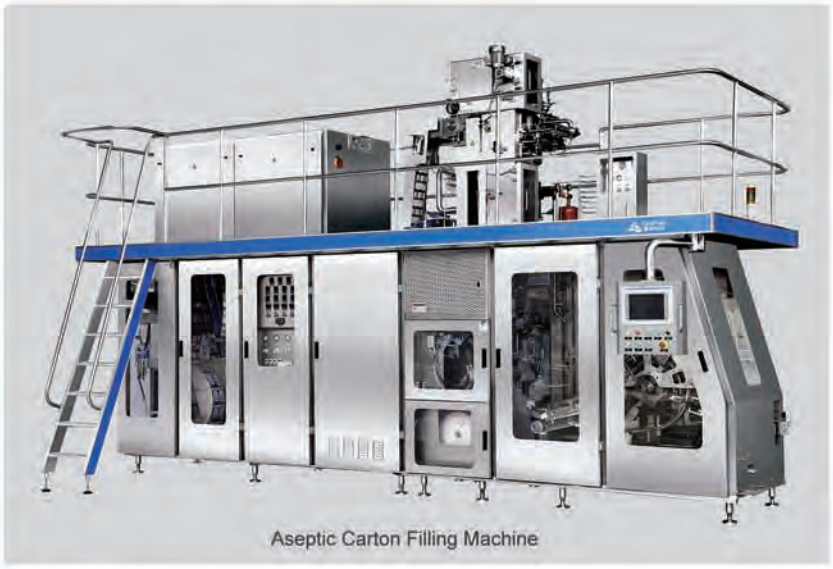

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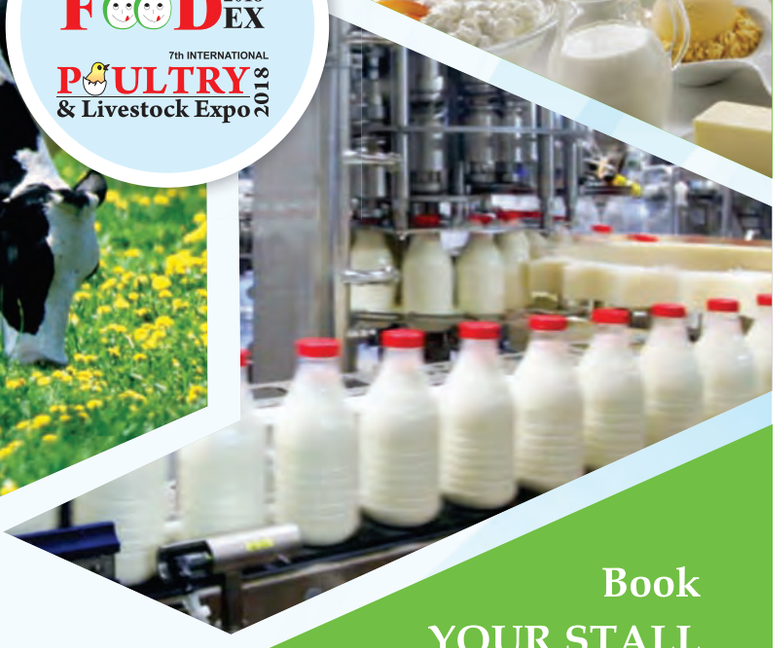

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The **table blender** is used to dissolve solid/powder products in recirculated liquids. It has a wide range of applications, for example, preparation of pharmaceutical syrups or **dissolution of pectin in glucose** for marmalade production. Every model has an option with an in-line mixer for a complete dissolution of possible lumps. The typical applications are **reconstitution or stabilization of milk** in the production of dairy products, and **dissolution of sugar** for the production of syrup in the beverage industries.

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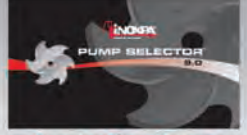

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INDORE	- 99815 40667			BANGALORE	- 99163 06999	HUBLI	- 94808 38462

Contact: Milk

CITY	PHONE NO.	CITY	PHONE NO.
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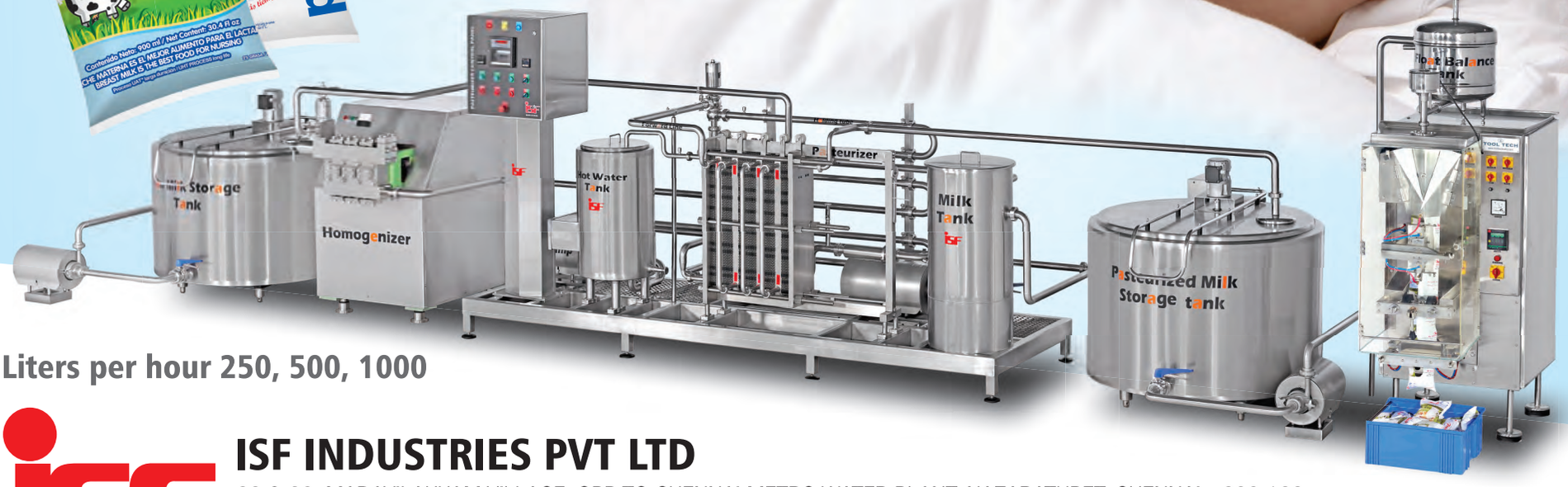

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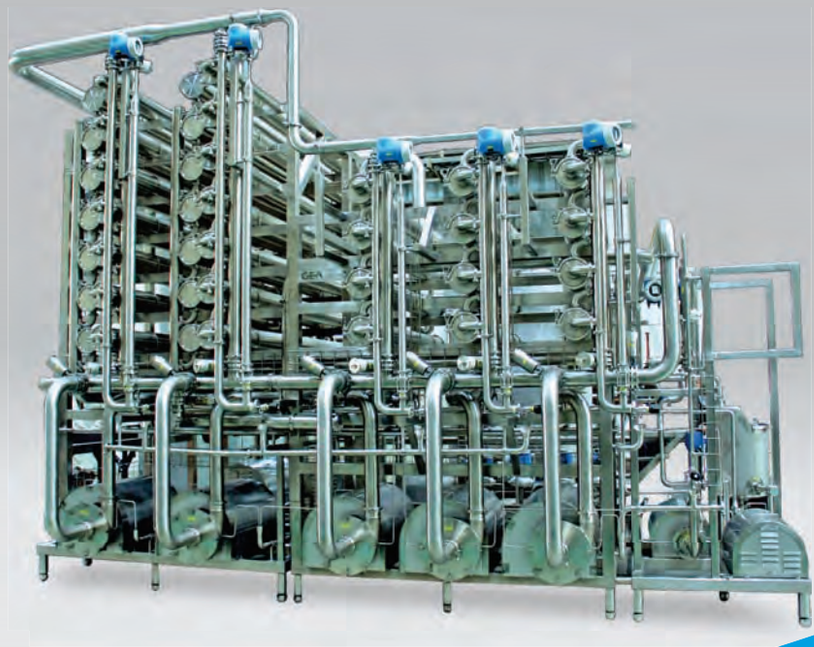

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The **application form** can be downloaded from the website of Indian Dairy Association (**https://www.indairyasso.org/bestdairyplant.htm**) and duly filled in applications should be sent to Mr. Gian Mutreja, GM, Model Dairy Plant, ICAR-National Dairy Research Institute, Karnal-132001 (Haryana); Tel : 0184-2250817/2258349. E-mail: g.mutreja@gmail.com

The applications should be accompanied with a fee of Rs. 5,000/- in the form of either cheque or Bank Draft or can be transferred directly to Indian Dairy Association (North Zone), Syndicate Bank, Sector-V, R.K. Puram, New Delhi. SB a/c no.: 90562010064217 (IFSC Code: SYNB0009009).

The last date for receipt of applications is 30th April, 2018.

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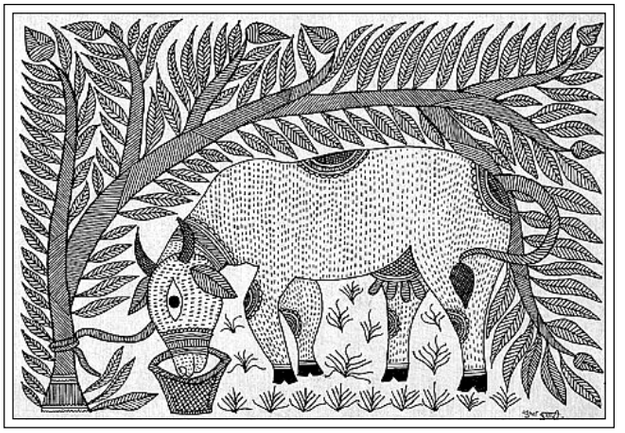
MILK Products

Below are prices of selected National Brands of Milk Products. Wholesale and Retail Prices are separately indicated.

Source : Gujarat Cooperative Milk Marketing Federation, Delhi, and direct receipt from sales office of some brand.
Prices indicated as on March 23, 2018



WHOLESALE PRICES

Skimmed Milk Powder

Brand	Price (per kg)
Gokul	163.00
Krishna	—
Madhusudan	205.00
Sagar	260.00
Sourabh	225.00

RETAIL PRICES

(Taxes included)

Skimmed Milk Powder

Brand	Pack Size	MRP (Rs.)
Anik	500 gm Pouch	195.00
Gokul	1 kg pouch	300.00
Madhusudan	1 kg pouch	300.00
Sagar	500 gm Pouch	150.00
Verka	1 kg Pouch	250.00

Infant Milk Powder

Brand	Pack Size	MRP (Rs.)
Amul Spray	500 gms tin	182.00
Amul Spray	1kg tin	350.00
Lactogen I	400 gm refill	—

Butter

Brand	Pack Size	MRP (Rs.)
Amul	500 gms	225.00
DMS	500 gms	175.00
Gokul	500 gms	220.00
Mother Dairy	500 gms	225.00
Vita	500 gms	207.00
Verka	500 gms	220.00

Ghee

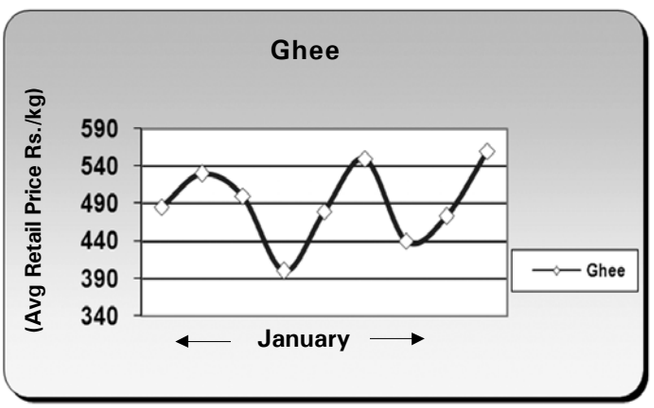
Brand	Pack Size	MRP (Rs.)
Amul	905 gm (refill)	485.00
Anik	1 ltr (CTN)	530.00
Gokul	1 ltr (Ploy Pouch)	500.00
DMS	1 ltr (polypack)	400.00
Madhusudan	1 ltr (polypack)	480.00
Mother Dairy	902 gm (refill)	520.00
Verka	1 ltr (Mono Pack)	420.00
Vita	1 ltr (polypack)	473.00
Patanjali	1 ltr (polypack)	560.00

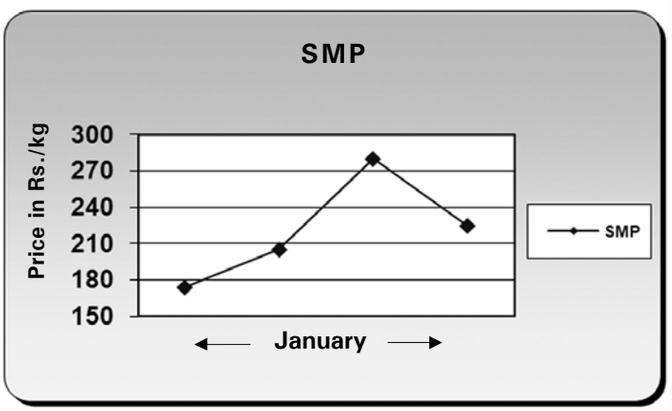
PRICE TREND OF WHOLESALE MILK PRODUCTS

The graphical presentation is for January 2018, based on the average wholesale price (exclusive of taxes) as available from the sources (the print media, GCMMF and USDA, Dairy Market News website)

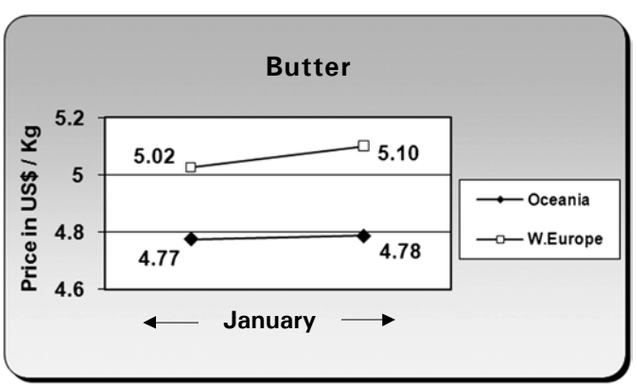
MILK Products

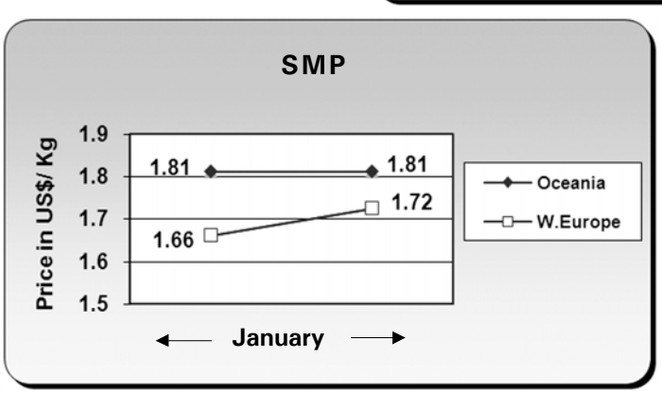
National

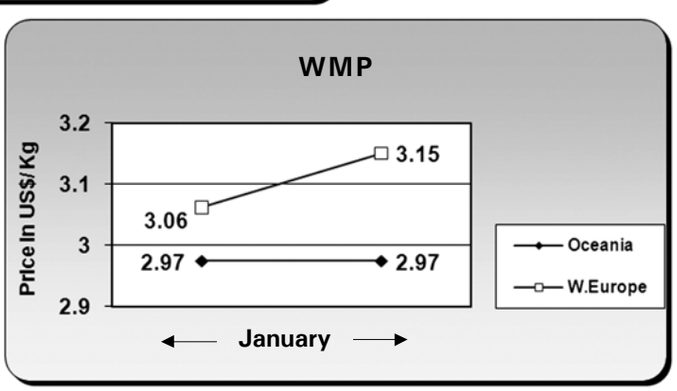




International







IDAnews

Argentinian delegation interacts with IDA office-bearers

A 22-MEMBER DELEGATION from Argentina showed a keen interest in various agricultural and dairy activities in India during its meeting with the office-bearers of the Indian Dairy Association (IDA) at the Lalit Hotel, New Delhi. The delegation was in India from 8 to 20 February.

Dr. G.S. Rajorhia, President-IDA, while addressing the delegation spoke about the history of dairy development in India with emphasis on the cooperative movement, implementation of the Operation Flood programme, and the factors that facilitated the speedy rise of milk production making India No. 1 in the world.

Dr. Rajorhia informed the delegation that India at present produces 165.4 million tonnes of milk valued at INR 5 lakh crores. Of the total milk produced, some 25% is processed by the organized cooperative and private dairies. The demand for milk in India is increasing @6.3% per annum. The dairy farmers in India get 80% of the price realized from consumers which is the highest in the world.

The Argentinian delegates were also informed about the history of the IDA and that its over 3000 members come from diverse fields. The IDA members include farmers, researchers, educationists, professionals, planners and industrialists.

Dr. R.S. Khanna, Chairman, Kwality Limited, and Mr. S.S. Mann, Chairman, IDA (North Zone), also addressed the delegation. The delegation sought information on the livestock growth, population, nutrition, and disease control programmes being implemented for cattle and buffaloes in India.

The Executive Committee members of IDA - TN State Chapter visit PGRIAS dairy farm

A meeting of the Tamil Nadu Chapter of the IDA was held at the Post Graduate Research Institute of Animal Sciences (PGRIAS) of the Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam on 20 January, 2018. The meeting was chaired by Dr. C. Naresh Kumar, Chairman, IDA - TN Chapter. Dairy entrepreneurs

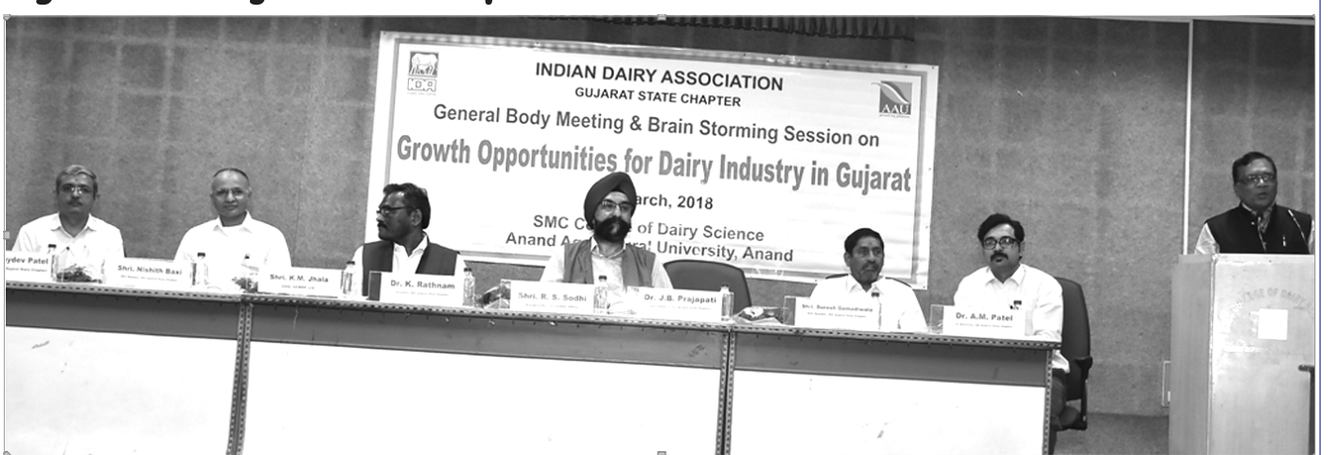
also participated in the meeting.

Arrangements were also made for the dairy farm visit of the Executive Committee members at the PGRIAS in collaboration with the university. Dr. H. Gopi, Professor and Head, PGRIAS, explained the dairy farm activities. Dr. S. Gunasekaran explained the hydroponic fodder production.

Special thanks to Dr. V. Ramesh Saravana Kumar, Director, Centre for Animal Production Studies, TANUVAS, Chennai.

The hydroponic fodder production unit

AGM, brainstorming session organized by IDA Gujarat Chapter



THE INDIAN DAIRY ASSOCIATION (Gujarat Chapter) organized its Annual General Meeting (AGM) on 10 March 2018, at the SMC College of Dairy Science, AAU, Anand.

The AGM was followed by a brainstorming session on "Growth opportunities for the dairy industry in Gujarat". About 150 professionals and IDA members from various dairy cooperative unions of Gujarat, academicians and private players attended the brainstorming session to gain an insight on what are the growth opportunities, challenges and the way forward for the dairy industry in Gujarat.

Dr. K. Rathnam, Chairman of the Gujarat Chapter and MD, Amul Dairy, applauded the role of the IDA (Gujarat Chapter) and also appreciated the efforts of the IDA team in organizing various seminars on relevant topics. He said, "Our commitment is that we will continue to organize such seminars so that members, farmers and dairy professionals are benefitted."

To strengthen the Gujarat Chapter, Dr. Rathnam suggested to strive for enrolling more members and improve the participation by industries.

Speaking on the occasion, Mr. Nishith Baxi, MD, Dudhsagar Dairy, Mehsana, said, "We should take this as an opportunity to be more progressive in future and focus on reducing cost and increasing efficiency of our technologists across the industry."

Mr. R.S. Sodhi, member of CEC and MD, GCMMF, mentioned that Gujarat is the torch-bearer of the Indian dairy industry. He expressed happiness that the Gujarat Chapter of the IDA is so much active. "There are a number of areas on which we can debate, but the most important is adulteration because besides being a health issue, adulteration affects the consumer trust," said Mr. Sodhi. He narrated the story of the Chinese dairy industry for melamine contamination and its ill-effects on the reputation of the industry.

The Gujarat Chapter organized three seminars for dairy farmers, veterinarians, and milk procurement experts. The State Executive Committee met seven times in a span of 15 months. Mr. Jaydev Patel, Treasurer, presented the financial report for 2017-18 and proposed the budget for the next year, which was unanimously approved by the general body.

Dr. Rathnam said that the Gujarat Chapter would like to host the Dairy Industry Conference in 2021 and also wish to organize a seminar in collaboration with the International Dairy Federation.

Four distinguished speakers expressed their views in the brainstorming session. Mr. Pavan Kumar, DGM (Mktg.), GCMMF, talked on future marketing strategies to escalate dairy growth in Gujarat. He said that despite the falling farm gate prices across the world, milk prices in Gujarat rose by about 15%. It is due to the undisputed marketing wizard, Dr. Kurien, who focused on consumer values and branding. He said that we have been insulated with price fluctuations because of our marketing efforts and the direct sale of value-added products to consumers. He appreciated that most of the dairy plants in Gujarat are investing in infrastructure development and strategy innovations. He empha-sized on expanding the global reach, like for ghee, which is exported to more than 30 countries.

Mr. Kumar stressed on three major aspects of dairy marketing strategies. The first being the sale of ethnic Indian products, in which brand Amul has an advantage. Amul was the first one to tell the world that paneer can be branded, packaged and frozen, and the same thing was done with Dahi.

Unfortunately, the entire dairy industry has missed out on Khoa and we couldn't tap the Khoa market which is more than 15 MT lakh tons per annum in India. The second big opportunity was the milk-based ethnic Indian sweets, like Rasogolla. Thirdly, he focused on the value-added ready-to-eat products.

Dr. Rajesh Subramanian, MD, IDMC Ltd. and CEC member of the IDA, talked about the status of dairy equipment manufacturing. Mr. Vijay Kapadia, AM (QA), Vasudhara Dairy, Valsad talked on the significance of quality in dairy business.

NATIONAL news

Hon'ble Prime Minister inaugurates national conference on Agriculture 2022 for doubling Farmers' Income

Hon'ble Prime Minister, Mr. Narendra Modi, inaugurated a national conference on "Agriculture 2022-Doubling Farmers' Income" at the National Agriculture Science Complex (NASC), Pusa, New Delhi. The conference, that was held during February 19-20, 2018, was organized by the Ministry of Agriculture & Farmers Welfare on the advice of the Hon'ble Prime Minister with a view to identify various critical issues relating to agriculture and farmers' welfare and finding appropriate solutions.

The main objective of the conference was to receive and implement the suggestions made by the participants, which will help in yielding quick results across the agriculture sector, comprising several sub-sectors, in addition to initiating long-term interventions. The conference was attended by 300 people comprising farmers, representatives of farmers' associations, scientists, economists, academics, people from the industry, professional associations, NGOs, policy makers

and officers.

Dr. Shyam Bhaskar, Member, Haryana Kisan Ayog, participated in the conference in Group 7 (Livestock, Dairy & Allied sector). He emphasised the importance of the livestock sector which contributes more than 28.7% share in the agriculture sector. Besides, milk production is also growing at more than 6.5% annually. This will help in promoting organic farming to hasten the process of doubling farmers' income in order to address the farmers' distress.

16th Convocation held at NDRI (Deemed University), Karnal

THE ICAR-NDRI organized its 16th Convocation on 10 March 2018. The Chief Guest at the convocation, Hon'ble Minister of Agriculture and Farmers Welfare, Mr. Radha Mohan Singh, presented the degrees and delivered the Convocation Address.

Congratulating the recipients of the degrees, the Minister said that the NDRI is providing a large number of trained young professionals to the nation in the areas of dairy production, processing and management. Expressing satisfaction at the production of milk in the country, he said that for the last 20 years, India continues to be the largest milk producer in the world, and the credit goes to research institutions like the NDRI for catering to the technological and human resource requirements of the dairy sector.

Mr. Singh said that in the past few years, various government schemes and initiatives have brought about a remarkable growth in animal husbandry. In the last six years, milk production increased from 121.8 million tons in 2010-11 to 165.4 million tons in 2016-17. In the first three years of this period up to 2013-14, the increase was 13%, thereafter the increase is over 20%. Per capita availability increased by only 9% from 2010-11 to 2013-14. However,

DAIRY SCOOPS

ANANDA DAIRY EYES 30% RISE IN TURNOVER IN FY'19

Ananda Dairy is eyeing over 30 per cent increase in turnover to ₹2,000 crore in the next financial year as it expands retail footprint as well as product portfolio.

The company is looking at opening 500 retail outlets, company-owned and company-operated, by the end of the next fiscal in States like Delhi-NCR, Haryana, Uttar Pradesh and Punjab.

"We are targeting over 30 per cent growth in turnover to ₹2,000 in financial year 2018-19. We expect retail outlets to contribute

15 per cent to sales. It is 10 per cent at present," Ananda Group Chairman, Mr. R.S. Dixit, said.

Currently, it operates over 200 outlets in the NCR. It sells about 50 products at present except ice creams.

EU APPROVES EDA GUIDELINES FOR CHEESE AS RAW MATERIAL

The European Dairy Association (EDA) Guidelines for Cheese as a Raw Material, a concise and state-of-the-art compendium on the high safety and quality of cheese as a raw material within the processing industry, have got the nod of the European Union (EU).

MAHARASHTRA TO DECLARE MILK ADULTERATION NON-BAILABLE OFFENCE

The Government of Maharashtra has promised that shortly, there will be a law in place declaring the adulteration of milk a non-bailable offence, and those found indulging in the malpractice will be imprisoned for upto three years. States such as Odisha, UP and West Bengal have amended their laws to deal with the issue of milk adulteration.

the increase was 15% between 2013-14 and 2016-17.

Emphasising the commitment of the Government to the dairy sector, the Minister said that the National Mission on Bovine Productivity with an allocation of ₹ 825 crore was initiated for genetic upgradation of cattle and buffalo population through delivery of breeding inputs at the farmer's doorstep. He expressed satisfaction that the NDRI is maintaining three very good Indian dairy breeds, Sahiwal, Tharparkar and Rathi at its Karnal campus and also Maland Gidda at the Bangalore campus.

The Minister said that the Government has launched the 'Rashtriya Gokul Mission' that aims to conserve and develop indigenous breeds. In this regard, 20 Gokul Grams have been approved in 13 States which will act as centers for development and protection of indigenous breeds. The Government has also established two National Kamdhenu Breeding Centrs in the country at Itarsi and Hoshangabad (Northern region) and Chintaladevi and Nellore (Southern region).

On the occasion, the Doctor of Science (Honoris Causa) was conferred on Dr. Trilochan Mohapatra, Secretary DARE and DG, ICAR by the NDRI Deemed University.

Dr. R.R.B. Singh, Director, NDRI, presented the progress report on the significant achievements made by the Institute during the past year. He said that at present, the Institute offers Doctoral and Master courses in fifteen different disciplines besides B.Tech. (Dairy Technology). At present, 928 students are studying in various programmes including 352 girl students and 5 foreign students from Syria, Afghanistan and Nigeria. The NDRI is operating five collaborative international research projects with the UK, the USA, Egypt, Denmark and Kenya. The NDRI has filed 4 patents and 2 patents have been granted. A total number of 556 research papers were published in the current year (2017-18). The Best Teacher Award was given to to Dr. Rajan Sharma, Principal Scientist, Dairy Chemistry in recognition of his academic excellence.

Among the dignitaries present at the convocation were Dr. J.K. Jena, DDG (Animal Science), ICAR, Dr. Rameshwar Singh, Vice Chancellor, Bihar Animal Sciences University, and faculty, Heads of different divisions and invitees.

G B Pant University of Agriculture and Technology to serve as a model for doubling farmers' income

HON'BLE UNION MINISTER of Agriculture and Farmers Welfare, Mr. Radha Mohan Singh, Hon'ble Chief Minister of Uttarakhand, Mr. Trivendra Singh Rawat, and Agriculture Minister of Uttarakhand, Hon'ble Mr. Subodh Uniyal, visited the GB Pant University of Agriculture and Technology (GBPUAT) and addressed farmers, students, faculty, staff, entrepreneurs and farm machinery manufacturers during the closing ceremony of Kisan Mela on 27 February 2018.

The university has done a commendable job in seed production. The

university can develop different models of integrated farming and displayed the same to the farmers. Speaking on the occasion, Mr. Radha Mohan Singh advised that a team of four scientists should adopt four villages to demonstrate the benefits of new agricultural technologies. Mr. Singh announced a ₹ 25 crore project for the GBPUAT to be developed as a model for farmers.

Prof. A.K. Mishra, Vice Chancellor of the GBPUAT, also spoke on the occasion. The GBPUAT has recently received the Governor's Best University Award for the year 2017. The Award consists of a certificate, a running trophy, and ₹ 2,00,000 for the university library.

Banas Dairy procured record 60 lakh litre milk per day in 2017-18

ACCORDING MR. SHANKAR CHAUDHARY, Chairman of the Banaskantha District Co operative Milk Producers' Union Ltd. (popularly known as Banas Dairy), the cooperative has procured milk at an average rate of 60 lakh litre per day, this year.

Addressing milk producers on the 'Milk Day' jointly organized by the Gujarat Cooperative Milk Marketing Federation (GCCMF) and Banas Dairy at its chilling centre in Danta, Mr. Chaudhary said, "For the last two years the dairy has been procuring 40 lakh litre per day, but this year they were able to make a record of 60 lakh litre per day, which is a new high." He added that at a time when the dairy farming was under stress, Banas Dairy has been paying lucrative returns of ₹ 700 per kg fat to milk producers.

Mr. Chaudhary exhorted women milk producers, who are the backbone of the dairy industry, to ensure best quality of milk by feeding good quality fodder to their cattle.

The Managing Director of Banas Dairy, Mr. Bipin Patel said, "If we progress at this rate, we will be able to procure one crore litre per day by 2022, which will be a new record."

CALENDAR

IDF WORLD DAIRY SUMMIT 2018

Oct. 15 - 19, 2018
Daejeon Convention Center
Daejeon, South Korea

IDF World Dairy Summit 2018, is being held in Daejeon, the New Hub City of Korea. The theme of the summit is "Dairy for the Next Generation!".
Over 1,500 dairy leaders from all over the world are expected to participate in it. Over 150 international speakers will address current and future issues.
The summit may provide you with a highly effective business and marketing platform so that you can connect with global delegates
For further information, visit: www.idfwds2018.com

ESADA TO ORGANIZE 14TH AFRICAN DAIRY CONFERENCE AND EXHIBITION

20th - 24th Aug., 2018
Nairobi, Kenya

Eastern and Southern Africa Dairy Association (ESADA) is organizing the 14th African Dairy Conference and Exhibition. The event will take place in Nairobi, Kenya.
For more information, contact at secretariat@dairyafrica.com, www.dairyafrica.com

A TRAINING AND VISIT PROGRAM IN MICHIGAN

August 11th-22th, 2018
Michigan State University, USA

Michigan State University, USA has offered a 10-day dairy visit program in Michigan dairies. Some of the program components include introduction of world dairy market; Breeding, milking animal health care, nutrition and feed management; Robotic milking, quality milk production, advanced milk transportation to processing plants; Mechanization of small and large dairy farms. For further information contact joshin@msu.edu / dvmallik@gmail.com

Uttar Pradesh attracts investments worth ₹ 4.3 lakh cr

UTTAR PRADESH has signed 1,045 pacts worth ₹ 4.28 lakh crore on the first day of the UP investors' summit, Hon'ble Chief Minister, Mr. Yogi Adityanath, said while addressing the summit on February 21 last.

"It is a matter of pride for the State that Fortune-500 companies are participating in this summit. I want to tell you all that till now we have signed 1,045 MoUs worth ₹ 4.28 lakh crore. I have recently presented a budget of ₹ 4.28 lakh crore and the figure of MoUs signed is the same... We are heading towards new UP," said Mr. Adityanath.

He said he would himself oversee that the MoUs are executed, and those who are coming to invest in the State get all the facilities.

"I welcome all the guests including industrialists. With PM's guidance and blessings, UP is heading towards development and shedding its Bimaru tag. We are trying to become developed. PM's guidance helps us in good governance and taking the State on path of development," he said. "The summit is an attempt to establish UP among the developed States, and its focus areas include food processing, dairy, handloom and textiles, MSME, IT, start-ups, electronic manufacturing, films, tourism and civil aviation," the Chief Minister added. Stressing that the State was providing basic needs for investment like law and order, infrastructure, power and roads, he said he would ensure a transparent and answerable administrative set-up.

The State Investment Promotion Board has also been set up to facilitate industrialists willing to invest. "For ease of doing business, approvals, permissions, and licences are going to be under one roof. We are going to implement digital clearance which will be monitored by the CM office," he said.

FSSAI invites feedback on draft standards for whey protein concentrates and colostrum

THE FSSAI has developed standards for milk protein concentrates, whey protein concentrates and colostrum and colostrum products under the Food Safety and Standards Regulations (FSSR), 2011, and those pertaining to food additives.

The country's apex regulator issued a draft gazette notification to invite comments and suggestions from the stakeholders within a period of 30 days from the date of publication of the draft regulations.

On the basis of the comments and suggestions, these draft standards, which specify product definitions, compositional and quality parameters, as well as specific additives and labelling requirements will be reviewed, and revised, if necessary.

"The objections or suggestions, if any, may be addressed to the Chief Executive Officer, FSSAI, on or before April 4, 2018," said FSSAI.

"The revised standards will be notified for implementation within a period of six months," it added.

Under the amendments in Regulation 2.1, after Sub-regulation 2.1.20 relating to edible lactose, Sub-regulation 2.1.21, pertaining to milk protein concentrates, has been added.

Whey protein concentrate is defined as a white to light cream-coloured product with a bland, clean flavour, obtained by removing non-protein constituents from whey by means of physical separation techniques such as precipitation, filtration, dialysis and other relevant techniques.

Colostrum is defined as the lacteal secretion from the mammary glands of cows or buffaloes, or a combination thereof, obtained up to three to five days of parturition and preceding the production of milk, which typically contains fat, proteins, carbohydrates, vitamins, minerals and bioactive components (such as immunoglobulins and lactoferrin).

fssai
Food Safety and Standards Authority of India

ITC introduces Aashirvaad Svasti in Munger, enters pouch milk category

ITC LIMITED has forayed into the pouch milk category with the rollout of *Aashirvaad Svasti*, a brand of homogenised milk, at its dairy plant in Munger, Bihar, the hub of its dairy operations. With this development, the company expanded its dairy portfolio beyond ghee and dairy whitener. The newly-commissioned milk packaging facility was inaugurated by Mr. Pankaj Kumar Pal, Divisional Commissioner, Munger.

ITC Limited

ITC's newly-launched pouch milk undergoes homogenisation making the milk easier to digest and richer in taste. It also results in the preparation of better tea and curd. ITC's *Aashirvaad Svasti* homogenised milk also goes through a five-stage quality check to ensure its purity.

The product has been launched at ₹19 for a 500 ml pouch pack. To commemorate the occasion, ITC also conducted a launch meet for its retail partners at its Munger dairy plant.

The company has been engaging with dairy farmers in the Munger region since 2012. It has been providing veterinary extension services with an objective to improve milk productivity in the region. ITC's extension services currently cover close to three lakh cattle in the Munger region. Its livestock development programme has serviced over 16 lakh milch animals so far in the country, improving productivity and supplementing rural incomes.

INTERNATIONAL *news*

Fonterra to make gains in global market with Bangladesh deal

FONTERRA is set to make further gains in global market with new Bangladesh partnership. Fonterra is breaking new ground in South Asia's rapidly growing dairy market, with the signing of a new distribution agreement that will make Anchor available to millions more consumers in Bangladesh. The deal is part of the co-operatives ongoing efforts to enter in key overseas markets, by spreading the goodness of dairy nutrition.

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The population of Bangladesh has grown by more than 10 per cent in the last 10 years reaching over 160 million people and it now makes up over two per cent of the world's total population. Matched by strong economic growth, consumers in Bangladesh are looking for affordable healthy nutrition options, such as high-quality dairy.

Fonterra's Managing Director of Sri Lanka and Indian Subcontinent, Mr Sunil Sethi, said Anchor is well placed to drive growth, while improving the wellbeing of Bangladeshis.

"Our Anchor Full Cream Milk Powder, for example, comes with more than 23 vital nutrients including protein, calcium, vitamins and minerals. Anchor is specially formulated with 'NutriShakti™', a nutri-bundle that supports growth, energy and immunity."

Managing Director, ACI Agrolink Limited, Dr. F.H. Ansarey, said, "Anchor is a renowned global dairy nutrition brand and we have a shared vision alongside Fonterra to enrich people's lives by supplying safe, high-quality dairy nutrition to the people of Bangladesh."

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			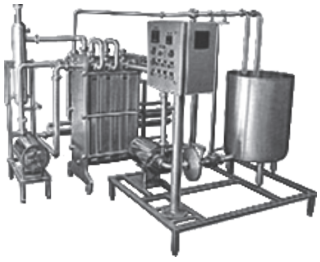
Batch Pasteurizer	**Ghee Clarifier Machine**	**Online Separator**	**Milk Pasteurizer**

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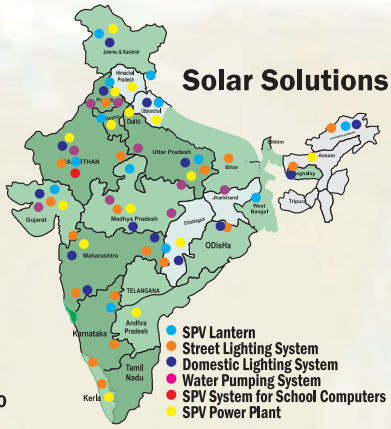
- PSE Excellence Award
- India Today PSU Award
- Governance Now PSU Award
- BT Star PSU Award for Innovation
- SKOCH Digital Inclusion Award
- eWorld Forum Award
- Rajasthan Energy Conservation Awards
- Best Employer Award
- Energy Efficiency 4 Star Rating Award
- State Award for Export Excellence
- Asia Pacific HRM Congress Award

Country Wide Deployment



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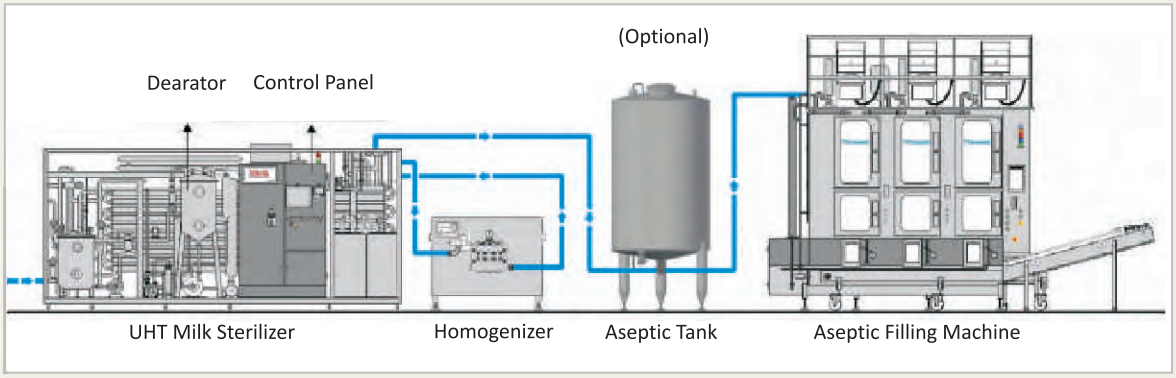

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BERTOLI — "High Pressure Homogenizers & Piston Pumps"

mbs — "Corrugated Tubular Heat Exchangers & Scrape Surface Heat Exchangers"

MilkyLAB — "Mozzarella Cheese Process Plant & Machineries"

REDA Food Processing Plants — "UHT Plants for Milk & Juice. Self Cleaning Separators & Bactofuges"

BARDIANI VALVOLE — "Range of Sanitary Leak-proof Valves"

Thimonnier — "Aseptic Pouch Filling Machine for UHT Milk"

REDA Food Processing Plants
an association
urge to progress... REPUTE thrust to succeed Since 1998
Thimonnier sterilized...

Happy New Year 2018

INNOVATED TECHNOLOGY

Aseptic Pouch Filling Machine for UHT Milk & Liquid Food Packaging...

ADVANTAGES OF REDA UHT PLANT

- Unique design of Tubular Heat Exchanger ensure long production cycles
- Tolerance to high operating pressure
- Less steam consumption due to high heat recovery
- Easy & user friendly software
- Simple procedures to change over products & capacities
- Compact design with protective covers
- Pre assembled plant to ensure fast installation & commissioning with minimum maintenance cost.

ADVANTAGES OF THIMONNIER ASEPTIC MACHINE

- Reinforced sterilization of the packaging film
- Sustained high-performance sterilization of the aseptic production zone
- Very high quality seals
- Exceptional dosing precision
- Very accurate film pulling
- Excellent machine performance with pouches of various sizes
- Easy, user-friendly & inexpensive machine usage & maintenance
- Can be easily connected to existing aseptic line through antimix valve
- CIP / SIP without dismantling
- All mechanical movements are driven by servo motors

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We Promise.We Deliver.

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that every milk collection center needs

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Milk Fat Measuring Machine

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Affordable, easily operable and high-quality products from Prompt

Fat'omatic™

Fully automatic and known for its rugged quality, accuracy and consistency

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- Auto zero operational facility
- Spe. Kit-Bag for safety and convenience
- Voltage fluctuation safety

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India's best Milk Analyzer; smart and intelligent with clear-cut cost advantage

100% indigenous product, making it cost effective, accurate and attractive (ABS body). Trusted by the Dairy Industry for over a decade

- FAT % — Max. accuracy in FAT values
- SNF % — Correct values of Solid Non-Fat
- Added WATER % — Detects the volume of added water in milk
- DENSITY — Projects actual milk density

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Upgrade to Prompt AMCS

Get the cloud connectivity between village level milk societies, milk producers and milk union at your finger tip

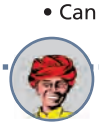
Digital revolution to minimize problems and maximize the benefits

- Prompt AMCS software automizes milk collection
- Milk Union Portal connects the Union to all milk societies, helping in real time tracking & managing
- Farmers App, Milk Union App and Kiosk at societies help track transactions in real time

Check-out how Prompt helps

Milk Union :
- Collects & manages all the detail on web portal
- Keeps itself informed via Milk Union App
- Keeps the track of milk-truck through transport App

Milk Societies :
- Collects data and uploads it on cloud with AMCS
- Can track & manage with VDCS App



Farmer/Members :
- Gets info on his mobile through Farmers App
- Gets SMS of various transactions
- Can check his a/c on society's kiosk

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Streptococcus thermophilus

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- Boosts Immunity
- Helps Metabolism
- Good Source of Protein
- Reduces Cholesterol Levels
- Reduces Risk of High Blood Pressure
- Excellent Diet Food

Types of Starter Cultures

- STANDARD YOGURT
- TRADITIONAL YOGURT
- CREAMY YOGURT

Units Available

2 Unit	:	20 Liter
10 Unit	:	100 Liter
30 Unit	:	300 Liter
50 Unit	:	500 Liter
100 Unit	:	1000 Liter
200 Unit	:	2000 Liter

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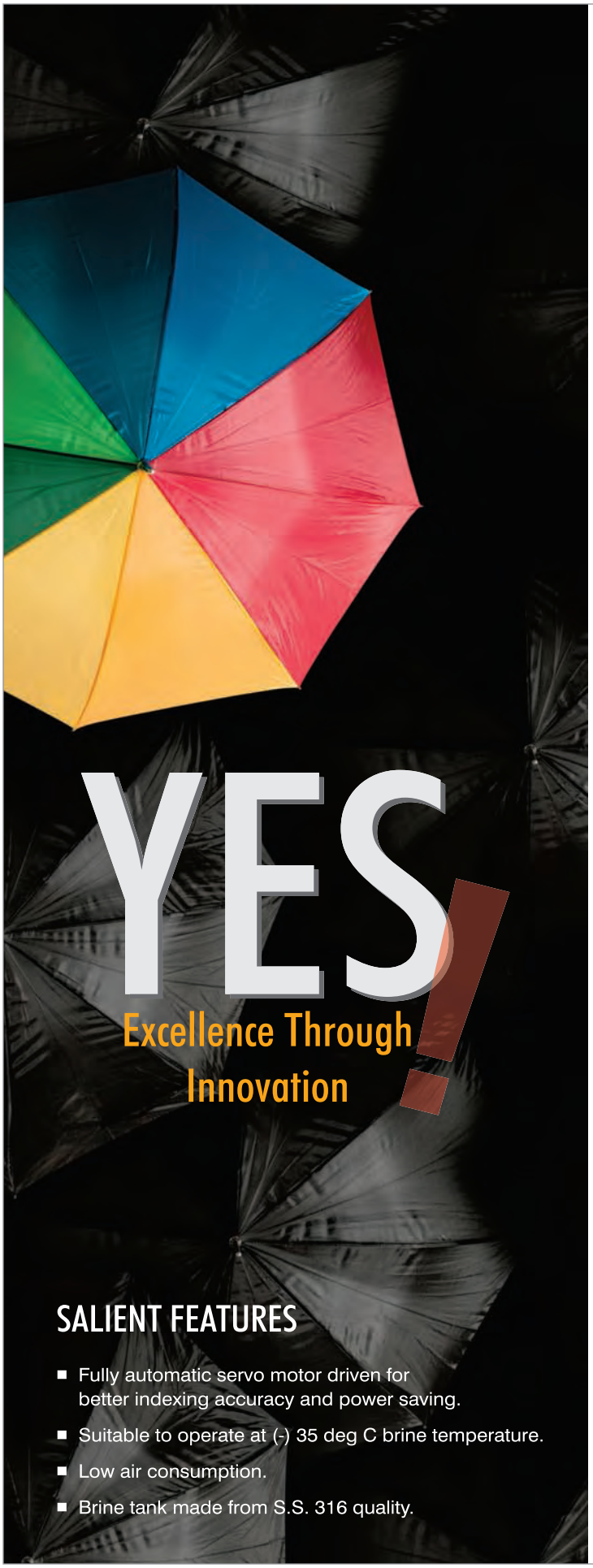

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Excellence Through Innovation

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- Fully automatic servo motor driven for better indexing accuracy and power saving.
- Suitable to operate at (-) 35 deg C brine temperature.
- Low air consumption.
- Brine tank made from S.S. 316 quality.

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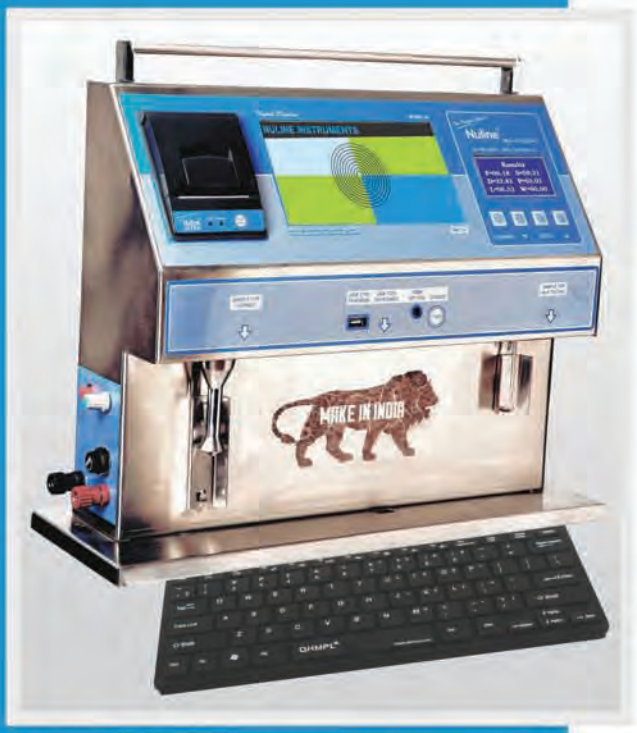
Kanha Milk Testing Equipments Pvt. Ltd

Nuline Bond i9



304 STAINLESS STEEL

TECHNICAL SPECIFICATION

MILK SCANNER

Parameter	Measuring range	Accuracy
Fat	0,01 – 25%	± 0,1%
Solids-non-fat (SNF)	3% – 15%	±0,15%
Density	1015 – 1040 Kg/m³	±0,3kg/m³
Protein	2% – 7%	±0,15%
Lactose	0,01% – 6%	±0,2%
Added Water	0% – 70%	±3
Milk sample temperature	1°C – 40 °C	±1%
Freezing Point	– 0,4°C — – 0, 7°C	±0,001%
Salts	0,4% – 1.5%	±0,05%

Environmental Conditions :
Ambient air temperature — 10°C –40°C (option 43°C)
Milk temperature — 1°C – 40°C
Relative humidity —30% – 80%

ULTRASONIC STIRRER
Ultrasonic Stirrer having adjustable time & vibration frequency
Input Frequency 45Hz to 60 Hz
Timer 5 to 30 sec adjustable on TFT Screen

DATA PROCESSING UNIT
Memory : 4 GB
SPEED : 220 Mhz
PROCESSOR : 32 Bit ARM Cortex M7

INTERFACES
INPUT : RJ-41 Weighing Scale
USB Keyboard

OUTPUT : RS 232 Remote Display Unit/Serial Printer
USB Data Import to Pen Drive

GENERAL
Dimensions : 400mm x 130mm x 350mm
Weight : 5.900 Kg. Approx.
Power Consumption : AC 80 Watt Max. & 12 Volt DC 52 Watt Max.
Power Supply : 12 Volt 10 Amp. Adapter/12 Volt DC

Salient Features

- Milk Analyser, Ultrasonic Stirrer & Data Processing Unit in One Unit
- Dual Display 7inch Colorful TFT Screen & 4 Line LCD Display
- Battery (DC) Voltage Display on TFT Screen
- 32bit ARM Microcontroller based embedded design
- Simple, easy to use, economical
- Built in secure calibration procedure
- No Acid or other chemical required
- Easy to clean
- Fast & Accurate
- Measurement Time-30-40 second
- In built thermal printer
- Interface with USB Keyboard
- Stainless Steel Milk probe horn
- Stainless Steel 304 cabinet
- Developed for indian electricity & Weather condition
- Built in reports
  - Shift summary
  - Member Report
  - Payment Report
  - Duplicate Slip
- Large Memory (4GB-more than 10 year data storage)
- Rate Chart download manually or pendrive
- Rate format based on TS (Total Solids) & Fat-SNF rate chart
- (encrypted Excel Format)
- Any weighing scale can be interface in DPU*
- Auto Tare (Zero) after the farmer slip printing and data storage automatically
- Import & Export of data to USB drive/Server (GPRS Facilities)

*Condition Apply

*Condition Apply

Kanha Milk Testing Equipments Pvt. Ltd

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Factory :
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Pallav Vihar, Bhoor Crossing
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Kanha Milk Testing Equipments Pvt. Ltd

Nuline DPMCU (Data Processor Milk Collection Unit)

SYSTEM COMPONENT

- **Nuline Ultra Milk Analyser**
  For Fat & snf Analysis
- **Ultrasonic Stirrer**
  Remove Air from fresh milk before testing
- **Data Processing Unit**
  For (FAT & SNF) recording, Billing & secure data transmission for data collection & MIS Reporting
- **Electronic weighing scale**
  (40/60/100/200 Kg/500 Kg with liter facility)
- **Solar Power Supply**
  12 Volt DC 100 Watt. Solar Panel
  100 Ah Solar Tubular Battery
  Solar Hybrid Charger
  15 Mtr. Aluminum Cable
  Solar Stand
- **Remote Display Unit**
  6 Parameters : Member Code, FAT, SNF, QUANTITY, RATE, AMOUNT

Delhi Office :
Kanha Milk Testing Equipments Private Limited
House No. 9/63, Bagichi Gali,
Vishwas Nagar, Shahdara, Delhi-110032
Mob.: 09412857986, 09259059111

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From **FOSS** your global partner in profitable dairying

Control and standardize liquid dairy products at various level

Raw material intake

Production

Finished products

MilkoScan™ FT1 Analyzer. Milk standardization with optional abnormality screening module

Rapid control at the platform for optimal segregation, fair payment to suppliers and spot on screening for abnormalities. Milk standardization for optimal use of raw material, improving economics and achieving consistent quality in products.

FTIR
Fourier Transform
Infrared Technology

Best Technology Highest Value.

MilkoScan™ FT1 ensure rapid returns and low running cost

Sample	Parameters
Liquid and semi-solid dairy products such as milk, cream, whey and others	Fat, Protein, lactose, Total Solids, SnF, FPD, Total Acidity, Density, FFA, Citric Acids, Casein, Urea, Glucose, Galactose

Also available

MilkoScan™ FT2

Standardization & sustainability. With operational flexibility throughout the process

It can measure a wide range of constituents (fat, protein, sugars etc.) in : Milk, yoghurt, whey, cream, milkshake, fermented products, sweetened condensed milk, icecream mix, dairy based desserts etc

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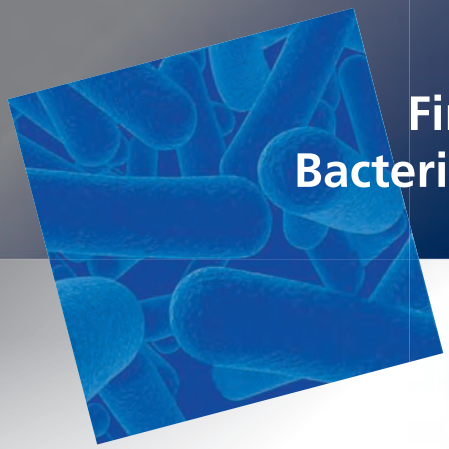

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Ideal for dairies & labs needing low volume, high performing analyzer

It offers full automation for minimal regent handling and consistent test results. A fast alternative to manual assay or semi-auto methods requiring risky regent handling.

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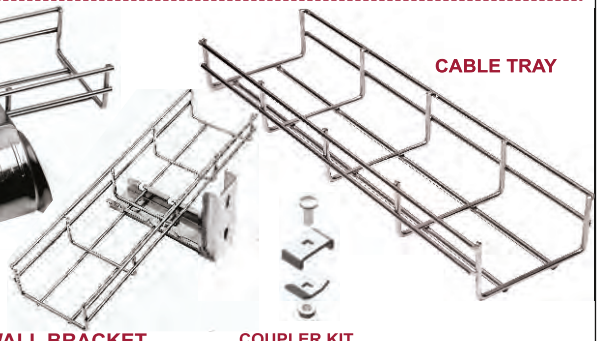

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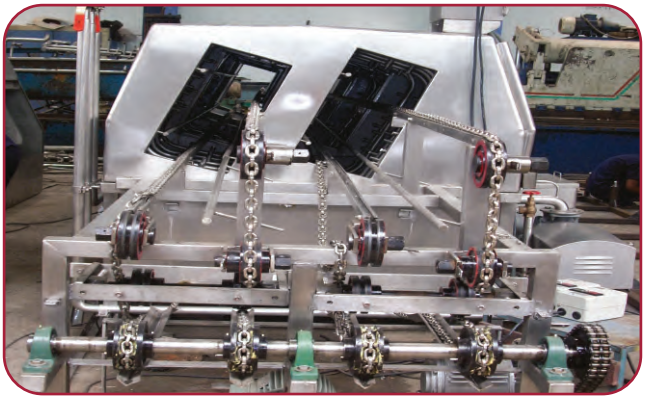
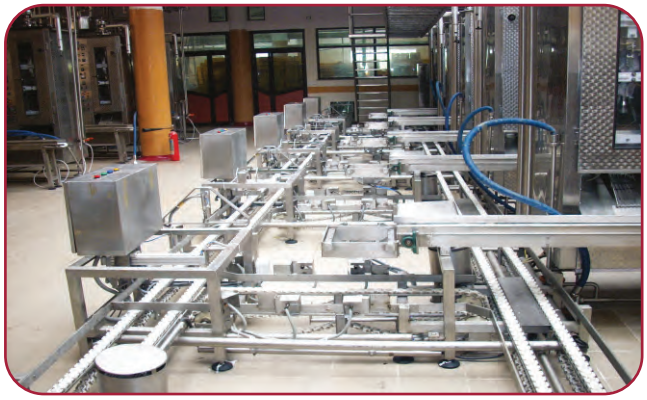
DOUBLE TRACK CAN WASHER

DOUBLE TRACK CONVEYOR



DOUBLE TRACK CRATE WASHER



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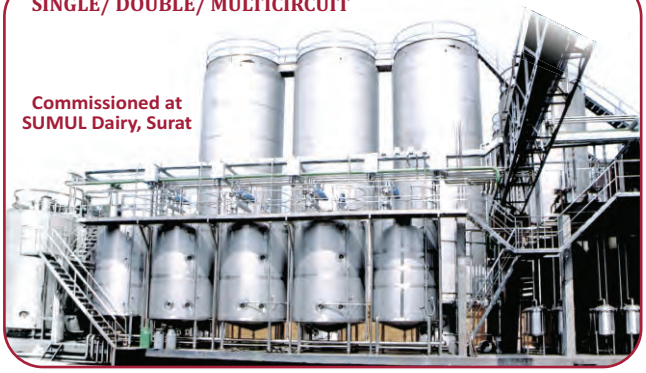

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- Drum/Roller dryer

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- Milk Silo
- Butter Churn
- Butter melting system
- Road Milk Tanker
- Khoa Pan
- Screw Conveyor
- Bottle Sterilizer
- Rotary Valve
- Blow through Valve
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thank your dairy farmer.

The joy is written large on your children's faces, when you treat them with their favourite cheese burgers.
But did you know that there is someone else also who needs to be thanked, apart from the restaurant using that delicious cheese slice or spread. It's your dairy farmer. The one who rises early in the morning, and works all year round. Who ensures that you get your daily glass of milk, or that soft paneer, delicious butter, rich dahi tasty cheese and creamy ice creams.

So, when your kids enjoy their cheesy burgers next, spare a silent 'thank you' for the dairy farmers. They deserve it.

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Rapporteur:
Mrs. R.L. Beena

Speakers:
Mr. R.S. Sodhi, Dr. P.Pugazhendi and Mr. R.G. Chandramogan

Technical Session : 2

Milk Production for Doubling Farmers' Income

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Speakers:
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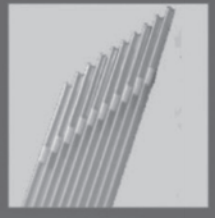

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Blockchain and Other New Technologies: New Generation Tools for Enhancing Milk Production in India

By
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The path to enhancing milk production in a sustainable manner is through enhancing profitability of dairy farming by reducing cost of production not through market or market intervention/support mechanism. At micro-level, certainly new niche markets for milk and milk products are appearing on the horizon where higher market power lies with the producer and thus can yield higher profit by way of higher market price. But these will remain small scale, for the premium market segment forms a only a small portion of the total market. Therefore, for majority of farmers the pathway to enhancing profit is through cost reduction. It could also come from improving efficiency and lowering of losses and risks involved in dairy farming. Importantly, all the three are well within the control of the farmer. They are not being attempted due to lack of information about the animal and a suitable reference point. Such actions at the farmer level can only be an outcome of feedback from information about the individual animal vis-à-vis a reference point. The reference point could be the animal itself if past data is available, otherwise there is a common standard. So, the key to transformation is information as shown in **Fig. 1.**

Lack of information relating to dairy animals plagues the Indian dairy sector. Being a hurdle, it prevents the sector from progressing at its true potential wherein individual farmers bear the cost and are the worst sufferers. It arises from the absence of a system of animal identification along with the lack of measurement and documentation of all animal related information, as private information. Consequent to the lack of animal-wise private information, relevant standards which should be public information available freely cannot be developed and be made available. These two together could have initiated learning from the feedback. As a result, a large unknown area develops as explained by Johari Window[1], preventing farmers from taking informed business decisions.

This also results in information asymmetry leading to adverse selection and moral hazard which prevent the markets for credit, insurance and animal operating in a competitive manner. As a result, banks do not provide credit even for short-term needs. Insurance companies

This paper was presented at Session -2.

[1] *https://en.wikipedia.org/wiki/Johari_window*

also prefer to stay away from the dairy animal insurance market except under compulsion by the Government. Animal buyers also are unwilling to play a premium price for the animal as they have to discount the probability of the animal turning out to be a lemon, as explained by George Akerloff[2]. Hence, there is little or no incentive for a dairy farmer to rear dairy animals, especially for breeding purposes and develop future herd, on a long-term basis. This is seen in real life from the reduction in the growth of the number of female adult animals in India. Between 2003 and 2007 censuses, they increased by 1.1 crore against only 0.6 crore between the 2007 and 2012 censuses.

The lack of financial resources further results in the inability of the farmer to purchase even day-to-day inputs on cash and quality basis. The liquidity crunch at home is aggravated by the milk marketers in the organized sector paying for the milk purchased only after 7 to 30 days. Hence, she suffers from her inability to improve milk production and earn a higher profit. As a result, the farmer continues to remain in a negative vicious cycle of inability to earn sufficient profit with no spare capital to be ploughed back into the business of dairy animal rearing.

It goes without saying that the farmer is a smart and rational individual and will maximise her profit while simultaneously minimising risks within the available resource constraint. Resources could be in terms of finance, information and skill. Hence, attending the underlying constraint of information and money as shown in the **Fig. 1** will enable India to break the sound barrier of 4 to 5% growth in milk production.

Theoretically, under the DKIW framework, once verifiable data is captured, it can be collated and analysed and moved to the information stage. Information can then lead to knowledge and finally to wisdom; all this at the individual farmer level with very little input from external sources.

This problem about information and finance can be easily corrected by way of establishing a Dairy Animal Information System (DAISy) operated by an agency, on the lines of National Academic Depository independent of all existing institutions. The independence of the agency and system ensures that the data collected are truthful and usable by all stake holders.

[2] *https://en.wikipedia.org/wiki/The_Market_for_Lemons*

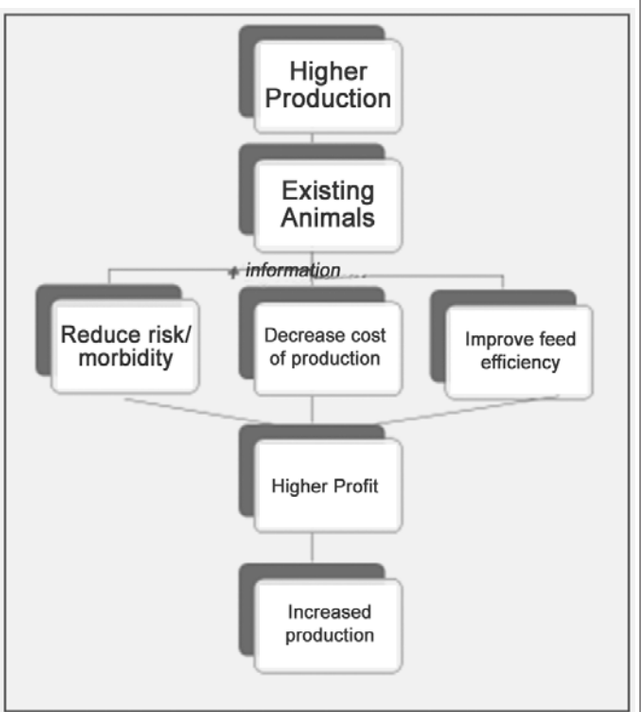

Fig.1: Information pathway to increased milk production

The advantages of such a system are shown graphically in **Fig. 2**. Firstly, it would enable every farmer to track his/her female animal on individual basis, for all techno-economic parameters on a dynamic basis. It will provide the farmer with relevant reference points to compare and thus help in rearing the animal in a more efficient and easy manner. It would facilitate the process of peer-to-peer learning by giving them an opportunity to compare production of their animals with the animals of their peers in the village. Grading and ranking of all animals becomes an immediate possibility.

Secondly, when information on individual animals is shared on a market platform, DAISy can create a competitive market for female dairy animals and their progeny (both male and female calves). The buyers armed with verifiable data with no information asymmetry will be willing to pay higher prices. This will incentivize animal rearers to bring in higher quality animals to the market.

Thirdly, when the animal-specific private information is selectively shared, it can enable credit agencies come

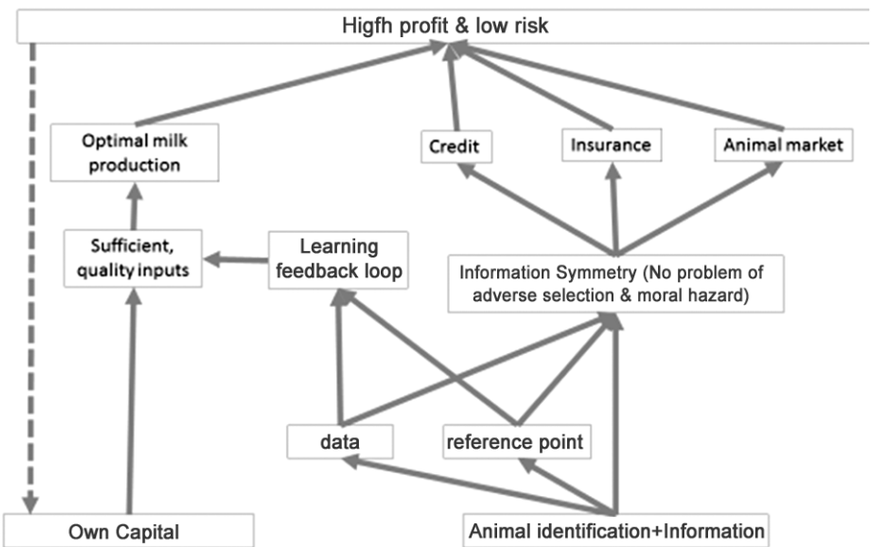

Fig. 2: Benefits of Establishing a Dairy Animal Information System (DAISy)

forward with new credit products for dairy animal rearing and purchase, moving away from the one-size-fits-all product being peddled today. In fact, an animal-cum-farmer specific credit rating system can be put in place, which would free the farmer from past credit history and build a new independent credit rating system, specific to dairy animal rearing paving way for farmers to move to a cash flow-based credit rather than collateral based credit.

Fourthly, sharing information selectively by the farmer with insurance companies can help her obtain risk-mitigating products based on information specific to the animal and the farmer. This would reduce the risk that overhangs on the capital investments being made on the purchase of a dairy animal by the farmer, in terms of mortality and permanent total disability (PTD).

Once credit is available and financial risk of rearing dairy animals is reduced, more farmers will take up rearing of good quality animals and become more financially inclusive. This will not only stem the reduction in the population growth of female animals but also improve their quality in terms of milk production capacity.

DAISy would use a simple application on cell phone which will act as the input and output device. On capturing the data, it will provide consolidated information about the animal to the farmer in an easily readable and understandable format in a graphical form and in local language. Animal data entered is corroborated and confirmed at the time and point of entry, to allow the farmer and the respective agency to take responsibility for the data entered.

The data that can be collected is given in the format shown in ***Table 1*** along with the frequency of collection by the agencies that would be responsible for the same. It can be seen that the role of the farmer and the farmer's collective is very high as they are involved in every data. The veracity of the information collected can be confirmed by third parties beginning with peers as a collective through the Participative Guarantee Scheme (PGS) and by others using communication tools. A transparent and severe penalty system would be in place for those trying to beat the system by ensuring that the cost of beating will be more than the cost of following it.

Data would be entered in a dynamic manner 24x7 using applications on smart phones, and every single identified animal would be locked to the owner, health and breeding service provider and the milk marketer through their individual cell phones. Cost-effective Information and communication technology (ICT) available today, beginning with resources available on the cloud by way of low-cost smartphones, makes the creation of this platform not only feasible but also affordable and self-sustainable. This would enable tracking and verifying each data entered against an animal in terms of time, place and person.

In this year's budget speech, the Government of

Table 1

Information detail	Frequency	Agency responsible
Milk yield	Daily (twice a day, preferably)	Farmer, farmer collective
Milk yield & quality	Once in 10 or 30 days	Milk marketer & Farmer collective
Breeding, confirmation of conception / calving and calf identification	As and when it occurs	Breeding service provider & Farmer collective
Prophylactic actions like vaccinations and tests for contagious diseases including sub-clinical mastitis	As per a pre-defined schedule	Health service provider &farmer collective
Disease Outbreak	Immediately on observation	Farmer
Disease Outbreak	Within 24 hours of farmer reporting	Health service provider & farmer collective
Therapeutic intervention	As and when it occurs	Health service provider & farmer
Animal registration	Within 24 hours of birth or purchase	Breeding service provider & farmer
Animal purchase & sale & auction	As and when it occurs	Health / Breeding service provider, Milk marketer, farmer & farmer collective
Credit for Animal	Immediately	Farmer, farmer collective and credit agency
Animal Insurance	Immediately	Farmer, farmer collective and insurance company
Death of Animal	Immediately	Farmer, farmer collective, credit agency and insurance company

India has said that it will support proactively the use of blockchain technology and the Niti Aayog has also agreed in principle to support its use in agriculture. DAISy is expected to be run on this blockchain technology as it ensures that the data entered into the system is tamper-proof and transparent. The strength of the blockchain technology is that it is secure by design with a high byzantine fault tolerance. Information using the blockchain technology is a chain of records of individual animals beginning with its unique identification number, birth and pedigree details. Data on growth, vaccination, deworming, breeding, feeding, calving, antibody titre, disease-free status, serum mineral profile, sub-clinical mastitis status over time and most importantly its milk production can all be built one over the other as a chain. Every data entry is time, date and place stamped. Since they all form part of a single chain and are held in a distributed ledger format with many copies at different places, it is impossible to tamper the data after entry. The credibility at the point of entryis assured by using the simple Participatory Guarantee System (PGS). For using the distributed ledger, the blockchain is maintained by a peer-to-peer network collectively, strictly adhering to a predefined protocol for accepting and validating new blocks of information.

Following the use of blockchain, "smart contracts" are only the next step wherein farmers can enter into contract with credit agencies to automatically provide cash flow-based credit in a transparent and pre-defined manner, automatically without the need for manual intervention. Similarly, the farmer may enter into a smart contract for insurance wherein she will agree to ensure a minimum standard of hygiene, management practice, vaccination schedule, etc. to obtain a lower premium rate. Failure of any of the commitments made in the smart contract will result in the contract being cancelled automatically or move to a higher rate of premium depending on the terms and conditions of the original contract. In fact, the insurance product can easily be merged into the credit system both for insurance premium payment as well as claim. On the animal market front, a farmer could even enter into a "smart contract" into the future by selling a calf that is yet to be born with an assured pedigree to prospective buyers, which can then even be seamlessly traded on-line. The advantage of the smart contract using blockchain technology is that the contract is valid only if all the pre-agreed upon conditions are met. One example of this that the calf to be bought in future is certified as free from a particular communicable disease like Brucellosis.

So, it can be seen that the dairy animal information system (DAISy) built on the blockchain platform can be a game changer for the Indian dairy sector and enable the individual farmer to move seamlessly to a higher plane of profitability and thus encourage production of more milk. Hence, now the ball is squarely in the court of professionals working in the dairy sector to roll out this intervention pan-India as quickly as possible and enable dairy farmers help themselves earn higher profit and increase milk production.

The icing on the cake is that another three new technologies in addition to blockchain viz. Internet of Things (IoT) using IPv6, Deep or Machine Learning and Artificial Intelligence (AI) have just been declared as amongst the top ten technologies that are going to change the world in 2018[3]. Each of them has much application in making the spread of blockchain technology easily adaptable by the dairy animal farming community, with minimal external manual intervention and facilitate its spread across the country and make dairy farming an exciting, modern and profitable vocation for youth of rural India. It will also be self-sustainable and decentralized. Hence, Government of India may need to review its policy decision to support identification of all dairy animals by using only the very old system of a 10-digit number on the plastic ear tag and supporting an institution-centric animal information system.

[3] *https://www.computer.org/web/pressroom/top-technology-trends-2018accessed on 9th Feb 2018*

Technical Session : 3

Application of Engineering and Technology for Furthering Efficiency

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Application of Spinning Cone Thin Film Technologies in Deodorization and Evaporation Dairy Industry*

By
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Introduction

Dairy activities have traditionally been integral to India's rural economy. The country is the world's largest producer of dairy products and also their largest consumer. Almost its entire produce is consumed in the domestic market and the country is neither an importer nor an exporter, except in a marginal sense. Despite being the world's largest producer, the dairy sector is by and large in the primitive stage of development and modernization. Though India may boast of one of the world's largest cattle population, the average output of an Indian cow is significantly lower compared to its American counterpart. Moreover, the sector is plagued with various other impediments like shortage of fodder, its poor quality, dismal transportation facilities and a poorly developed cold chain infrastructure, less value addition opportunities, etc. As a result, the supply side lacks in elasticity that is expected of it.

On the demand side, the situation is buoyant. With the sustained growth of the Indian economy and a consequent rise in the purchasing power during the last two decades, more and more people today are able to afford milk and various other dairy products. This trend is expected to continue with the sector experiencing a robust growth in demand in the short and medium run. If the impediments in the way of growth and development are left unaddressed, India is likely to face a serious supply-demand mismatch and it may gradually turn into a substantial importer of milk and milk products.

Meanwhile, this threat provides an opportunity for the domestic industry to improve its processes on productivity and efficiency as well as innovate on products by employing modern technology. The Spinning Cone thin film technologies are adopted worldwide in the dairy industry for deodorization of milk and cream as well as production of high quality dairy protein concentrates.

1. Deodorization of Milk and Cream

Inconsistent and undesirable odour components are getting into milk and derivatives due to:

- Undesirable feed flavours, such as weed taints or grassy notes
- Off odours originating from the animal, such as "cowy" flavours
- Flavours developed during transportation or storage, such as oxidation flavours

The Spinning Cone Column (SCC) thin film distillation equipment removes these odours without sacrificing the fresh flavour of the raw milk or cream.

* *This paper was presented at Session -3.*

This helps achieve flavour consistency throughout the year in products manufactured from the deodorised cream or milk.

The gentle treatment of the product within the SCC results in minimal damage to the fat globules, reducing crystallisation times during the butter making process. Further, the parameters of the SCC may be easily adjusted throughout the year to control the degree of off-note removal. The SCC uses approximately 20% of the steam required by alternative deodorisation techniques making it more cost-efficient to operate.

Simultaneous deodorisation and pasteurisation is achievable within the SCC and it has been designed to operate hygienically in the dairy environment and to meet industry standards, such as NZCP7 and USD3A.

Principle of Operation

The SCC is a unique aroma recovery technology that consists of a vertical stainless steel column, through which stripping steam removes volatile compounds, often under vacuum. It can process clear liquids as well as viscous liquids such as mango or banana pulp, or slurries such as tea or coffee mixtures.

The residence time within the SCC is only 25 seconds. This means that the aroma-stripped product is not damaged in any way and can be further used in downstream processing. Control of various operating parameters also allows the user to 'remove' an undesired odour, or 'recover' a desired aroma without the need for further rectification.

One of the main benefits of the SCC is that the operating temperature of the system can be easily varied depending on the heat sensitivity of the product.

The SCC is a uniquely efficient counter-current liquid-gas contacting device, i.e. a distillation or stripping column, belonging to the same family of mass transfer devices as packed, plate and bubble-cap columns. The SCC is unique in its use of gentle mechanical forces to enhance inter-phase contact. This allows the rapid, efficient and cost-effective separation of volatile compounds such as aroma and flavours from a thin-film liquid system.

Internally, the SCC contains two series of inverted cones. Attached to the inside wall of the column is a series of fixed cones. Attached to the rotating shaft is another series of cones, parallel to the fixed cones in such a way that they alternate vertically: one fixed, one rotating. The product is fed into the top of the column. Pulled by gravity, it flows down the upper surface of the first fixed cone and drops onto the first rotating cone which spins the liquid (or

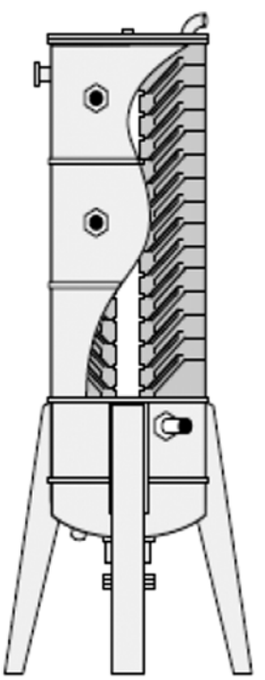


Fig. 2: SCC cones arrangement

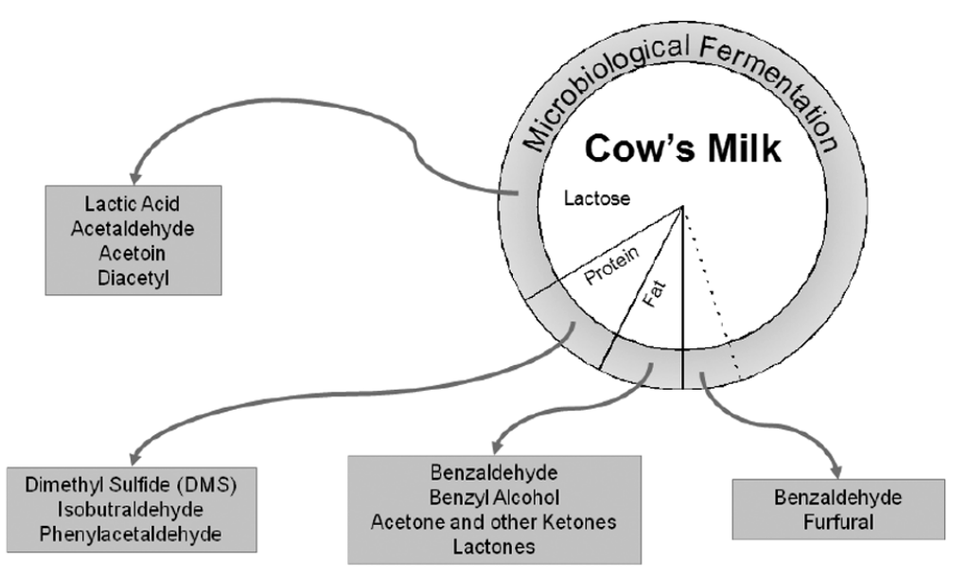


Fig. 1: Production of volatiles in milk on storage and handling

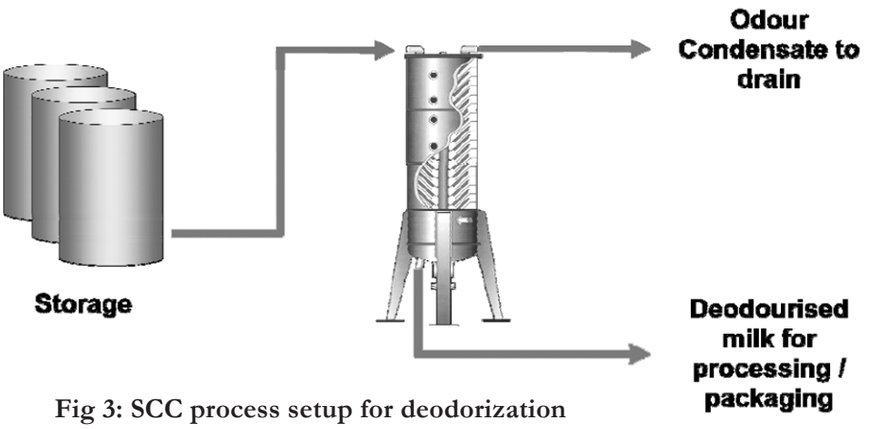


Fig 3: SCC process setup for deodorization

slurry) into a thin, turbulent film which is forced upward, out and off the rim of the spinning cone, dropping onto the next stationary cone below. In this fashion, the product works its way from cone to cone to the bottom of the column.

The stripping medium, usually steam, is fed into the bottom of the column and flows upward, passing across the surface of the thin film of liquid, collecting volatile compounds as it rises.

Fins on the underside of the rotating cones induce a high degree of turbulence into the rising vapour stream. This, with the turbulent, thin film of liquid and the long vapour and liquid path lengths, leads to the highly efficient transfer of volatiles from the liquid to the vapour stream.

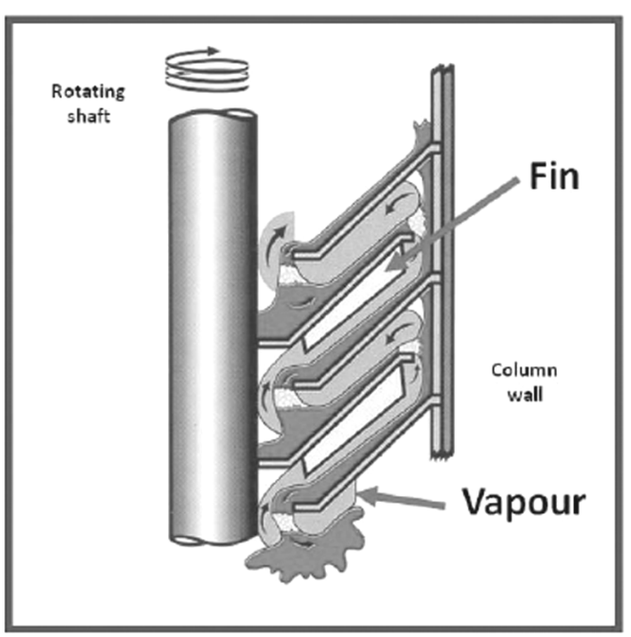


Fig. 5: SCC thin film flow paths

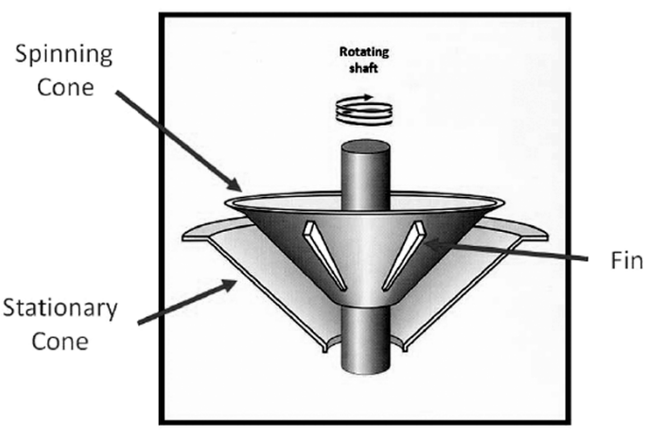


Fig. 4: SCC cones

The vapour flows out of the top of the column and passes through a condensing system, which captures the volatiles in a concentrated liquid form. The remaining stripped liquid or slurry is pumped out of the bottom of the column.

Benefits of SCC for deodorization:

- Low steam requirement in comparison to conventional processes
- Very high flavour stripping ability
- Treated product of high quality due to:
  - low temperature

Part of installation of eight SCC 10,000 columns processing dairy products

Fig. 6: SCC installation in dairy plant

– short residence time

- Less disruption / losses of fat globules
  - reduced energy for churning
  - reduced fat loss on churning

2. Concentration of Dairy Proteins

A strong growth in the demand for dairy protein powders is being driven by consumer focus on health, nutrition, and convenience products. With demand from the health and wellness sectors increasing this trend seems set to continue.

Among these, whey protein is of particular importance, arguably being the most nutritionally valuable dairy protein available. Their inclusion across product sectors is increasing – from functional foods to bakery, confectionery, dairy, ice cream products and more.

This increase in demand for whey protein has resulted in greater pressure on producers to increase production efficiencies in what is one of the more energy intensive and costly production processes in the food industry.

Use of a specialised, thin-film, spinning cone Centritherm® evaporator offers significant energy savings and opportunities to substantially increase throughputs of existing lines.

The current production systems in dairy protein powders involve feeding dryers at relatively lower concentrations. The high viscosity of the liquids coupled with the heat sensitivity of the proteins makes them particularly difficult to concentrate. They are therefore typically fed to the spray dryer having undergone only a minimal amount of water removal, typically by a membrane system. This high water content results in significant loads on the spray dryer, eventuating in lower throughputs, higher energy consumption and higher production costs.

Flavourtech Centritherm® evaporator

Flavourtech's spinning cone Centritherm evaporator is now being applied to the whey protein production process to gently remove water prior to drying. The one second product contact time and operating temperatures of less than 50°C result in significantly less thermal impact compared to conventional processes. This means minimal to no denaturation of the whey proteins. Additionally, the spinning cone design means viscosity is no longer a problem. The evaporator uses centrifugal force to transfer the product across the heated surface enabling it to process more viscous products than other evaporation technologies.

Centritherm model CT-9 installed for concentrating extracts

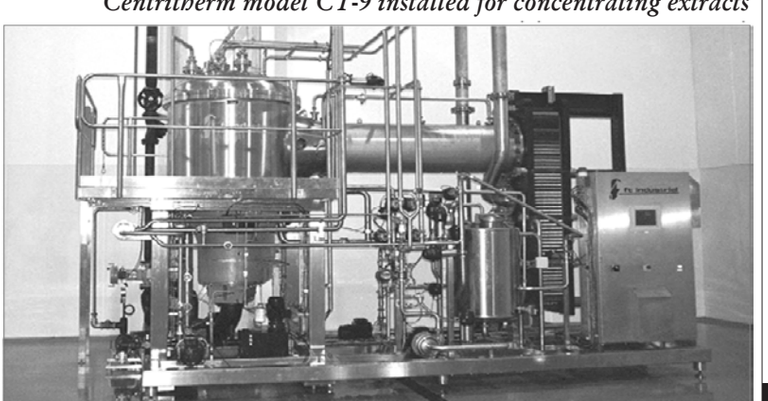


Fig. 7: Centritherm model CT-9

Flavourtech Centritherm® evaporator — Operating Principle

The Centritherm evaporator is a single effect spinning cone evaporator that operates under vacuum using steam as the heating medium. The heating surface is one or more spinning cones depending on the required capacity.

The general operating principle can be explained using Fig. 8. The product is pumped into the evaporator through the product feed tube and is fed through the feed nozzle onto the upper, inner surface of the heated spinning cone. Centrifugal force then generates the thinnest film possible in any evaporator and the product takes less than one second to pass down and across the evaporating surface.

The centrifugal force then comes into play once again, as it is used to push (or pump) the concentrated product (Fig. 8) through the stationary concentrate paring tube at the base of the cone and out of the evaporator.

Steam (typically at between 70°C and 95°C for dairy products[1]) is supplied to the steam chamber and condenses on the spinning cone, transferring its energy and driving the evaporation process. As soon as the steam condenses, it is immediately thrown to the outer wall of the steam chamber leaving the spinning cone free of any impeding 'steam condensate' layer and enabling heat transfer rates significantly higher than other evaporators.

Vapour driven off the product (Fig. 8) passes out of the evaporator to an external condenser (not shown), via the vapour duct, where it is condensed and pumped out of the system.

Processing Flexibility

The holdup volume within the Centritherm evaporator is so small and its heat transfer so effective that the technology rapidly reaches steady-state operating conditions upon start-up and shut-down. This makes it particularly suitable for:

- *Multiple products* — Rapid turnaround changing from one product to another.
- *Small batches* — Easy to process a series of small batches of different products.
- *High value products* — Minimal product losses during shut down and cleaning or if operation is interrupted.
- *A wide range of operating parameters* — This is a distinct advantage if, for example, the solids concentration in either the feed or the final concentrate needs to vary between batches.

Compact Installation

Compared to several other types of concentration systems, the Centritherm evaporator can remove more water per unit area and is therefore very compact in relation to operating capacity. Small footprints and low height requirements allow the Centritherm evaporator to be positioned within the factory, in close proximity to other equipment.

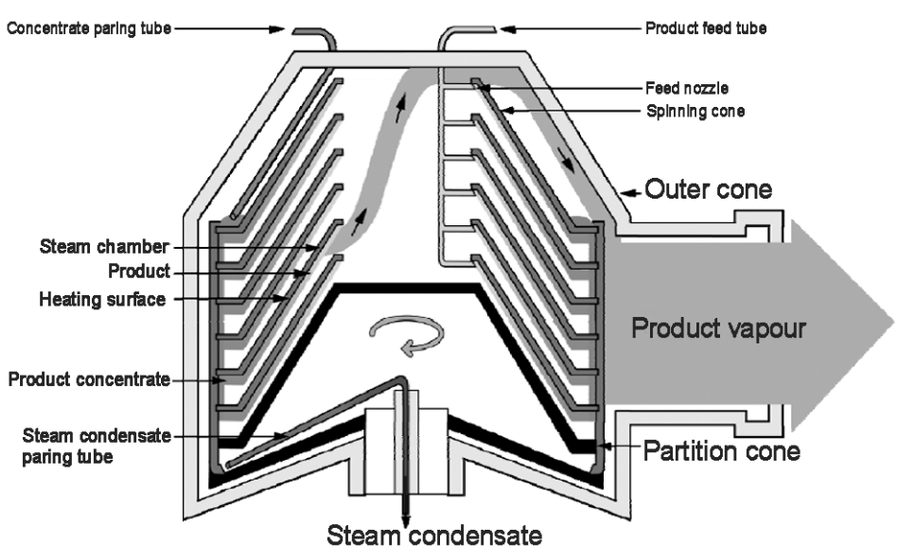
Viscous Products

The application of centrifugal force within the Centritherm evaporator helps to counteract the effects of high viscosity products. The unit has achieved reproducible results on some products where the final concentrate has a viscosity in excess of 20,000 cP.

Cleanability

The Centritherm evaporator is a hygienic system, with all parts in contact with the product manufactured from 316SS. An effective CIP function is included in the Centritherm evaporator's design

Fig. 8: Centritherm internal arrangement



[1] The maximum steam side design temperature is 120°C. However, generally only temperatures up to 95°C are used for concentrating dairy products.

and each system can be manufactured to meet the most stringent dairy standards where required.

With these design benefits the Centritherm evaporator is ideal for concentrating many of the heat sensitive, valuable, and viscous dairy products that exist, particularly products such as WPC70/MPC70 and above, MPI/WPI and Colostrum. The Centritherm evaporator allows the concentration of dairy proteins to much higher concentrations than other evaporators while maintaining protein activity.

Benefits of Centritherm evaporator:

- Energy savings up to 25% due to higher concentration feed to the dryer
- Spray dyer capacity increase ~100%
- High quality products
- Lower residual losses in case of high value products.

Conclusions

Thin film technologies — Spinning Cone Column and Centritherm evaporator — allow the dairy industry to process the materials with extraordinary gentle ways, without affecting the fat structure, active ingredients and other desired product attributes.

The industry gets benefited out of reduced energy consumption, standardized products and high productivity. It also allows the customers to innovate on the products and differentiate against competition, gaining more market share and consumer retention.

Electrospinning — A new Technique for Nanoencapsulation of Bioactives*

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According to the National Science Foundation, nanofibres are defined as fibres having at least one dimension of 100 nm or less. Nanofibres, owing to their large surface area-to-volume ratio, porosity, aspect ratio and flexibility in functionalization have great potential in food applications, particularly for fortification of foods. Methods for production of nanofibres are electrospinning, nanospray drying, self-assembly in the form of niosomes, template synthesis, etc. Amongst them, electrospinning is the most versatile technique to produce nanofibers due to its unique capabilities used to produce nanofibers from different materials with different morphologies, patterns, and functionalities.

Electrospinning can produce nanofibres with size ranging from 2 nm to several micrometres from different natural and synthetic polymers, utilizing electrostatic forces. In this process, a high voltage is applied to overcome the effect of other forces acting on the feed solution such as gravitational force, surface tension force and viscosity drag. Various factors that affect the fibre formation and morphology include solution parameters, process parameters and ambient conditions. Solution parameters are the concentration of polymer, its molecular weight, surface tension and viscosity. Similarly, process parameters such as feed rate, needle tip to collector distance and voltage affect the fibre morphology to a great extent. Ambient conditions such as temperature and relative humidity also affect uniform and continuous production of fibres from natural polymers.

A very high voltage of the order of several tons of kV is required for the formation of fibres in the nanoscale range. Hence, an electrospinning setup consists of a high voltage power supply (in the range of 10 to 30 kV), a polymer reservoir that can maintain a constant flow rate of solution, a syringe connected to the polymer reservoir either by a mechanical or a pneumatic syringe pump, a conductive dispensing needle (spinneret) connected to the high voltage power supply, and a conductive grounded substrate serving as the collector for the electrospun fibres. The polymer solution should be conductive. A standard

** This paper was presented at Session -3. The co-authors of this paper are Dr. Priyanka, Dr. F. Magdaline Eljeeva Emerald and Dr. B. Surendra Nath from ICAR-NDRI, Southern Regional Station, Bengaluru*

electrospinning setup is shown in figure given below:

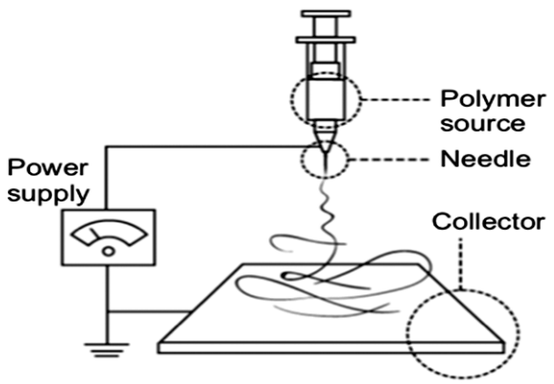

Fig.: The electrospinning setup

The food polymer is dissolved in a suitable solvent to make solution. The high DC voltage is applied to the system with opposite charges on the spinneret and on the collector plate. Normally, the spinneret is applied with a positive charge which becomes the source of flow of electrons, and the collector plate is given a negative charge. The high voltage charges the feed solution, which upon coming out of the spinneret is subjected to various forces. These include forces of surface tension, gravity and viscosity. At the critical voltage, the electrostatic forces of repulsion balance the forces of gravity, surface tension and viscosity which hinder the elongation of the droplet to form fibres.

When enough charge gets accumulated on the liquid surface, more electrostatic force of repulsion acts on the liquid droplet and a Taylor cone is formed at the tip of spinneret. When the electrostatic forces are strong enough to overcome the cohesive forces, a charged jet is ejected from the cone. The jet is stable only at the tip of the spinneret and is unstable afterwards. A whipping jet is formed near the collector plate. Evaporation of the solution takes place in the area between the spinneret and the collector plate due to convective forces. The dried fibres in the nanoscale range are collected on the collector plate.

The closed chamber where electrospinning takes place can be equipped with a UV heater or plasma source for controlling the cabinet temperature and relative humidity, which ensures uniform and fast drying of the fibres. Also the closed chamber protects the operator from high voltage source.

The collector plates are available in a variety of designs. It can be in the form of a plate (rectangular, square or circular), cylinder or drum (rotating at a high speed of more than 1000 rpm), parallel plate, static cylinder, mesh or grid, etc. The cylindrical rotating collector gives a better orientation of the fibres.

Electrospinning gives fibres a uniform size but the major disadvantage with this setup is the low production rate of about 0.003 kg/h. This problem can be solved by using multiple nozzles at a time. However, there is a problem of interference between the solution jets. Multiple nozzles have been tried successfully with controlling the distance between the needles.

Another alternative for electrospinning of fibres at a high production rate is using the nozzle-less process, wherein the spinneret is replaced by other fibre generating devices such as rotating roller, disc or spiral coil. The fibre generator, which is perforated, is dipped half in the solution. As the drum rotates, the feed solution gets deposited on the drum and fibres are formed under high voltage, which get deposited on a collector placed directly above. Although this method gives high production rate, it requires high voltage as compared to standard electrospinning. Another modification of the electrospinning process is coaxial electrospinning, involving two spinnerets. This technique helps in having two different ingredients in the core and the sheath of the spun nanofibre.

Both natural and synthetic polymers can be electrospun. Examples of natural polymers include collagen, chitosan, gelatin, casein, starch, alginate, dextran, cellulose acetate, silk protein, chitin, fibrinogen, pullulan etc. The electrospun fibres from these different polymers can be put into various uses. These natural polymers act as encapsulative carriers of active ingredients. Normally, bioactives cannot be electrospun as such into fibres due to flowability problems.

Along with the polymer, the solvent that is used to make solution also affects the electrospinning process. This is because the feed solution properties such as viscosity and surface tension are affected by the properties of the solvent. The solvent thus plays an important role in electrospinning. It dissolves the polymer molecules to form the electrifying jet and also helps to carry the electrified jet towards the collector. Most of the natural polymers, particularly those from polysaccharide sources, do not have sufficient charge for carrying the stretched liquid fibre to the collector. Acetic acid, water and ethanol are some of the common solvents used for encapsulation

of food ingredients.

The choice of the solvent is dependent on the polymer used. Some polymers are not soluble in water and some are not soluble in most organic solvents. In addition to the solvent, many other components for adjusting viscosity and mechanical strength of the polymers need to be added. For example, salts are added to increase the conductivity and surfactants are added to reduce the surface tension of the solution for enhancing the properties of the nanofibres. Any solution that is to be electrospun consists of 10-20 weight % of polymer and 80-90 weight % of the solvent, and hence, selection of proper solvent is very important.

Food Applications

Dror *et al* (2008) worked on nanofibres made of globular proteins. Protein conformation, protein aggregation, and intra/intermolecular disulfide bonds exchange helped control the spinnability and mechanical properties of the produced nanofibres. It was found that intra/intermolecular disulfide bonds could help in electrospinning of low-viscosity globular proteins. Also, the disulfide bonds provided molecular strength to the produced nanofibres.

Sessa *et al* (2011) evaluated the stability and antioxidant activity of nanoencapsulated resveratrol during in vitro digestion. Resveratrol was encapsulated in oil-in-water food-grade nanoemulsions of subcellular size, produced by high-pressure homogenization. It was observed that the nanoemulsions based on soy lecithin/sugar esters and Tween 20/glycerol monooleate were the most physically and chemically stable. The authors found that these formulations exhibited highest chemical and cellular antioxidant activities, suggesting that nanoencapsulated resveratrol, not being metabolized in the gastrointestinal tract, could be potentially absorbed through the intestinal wall in active form. Similarly, Zein, gliadin and other proteins from corn, wheat and barley have been successfully electrospun for drug delivery and other food applications (Brahatheeswaran *et al*, 2012). Zein has been shown to provide oxidation stability to fish oils. Zein encapsulated omega-3 fatty acids were less oxidized than nonencapsulated counterparts.

At the ICAR-National Dairy Research Institute, we are working on encapsulation of peptides using electrospinning. It was found that water could not be used as solvent for polymers such as pectin and sodium alginate. This is because water does not have a large number of charged ions needed for electrospinning. A feed solution containing pectin dissolved in acetic acid (75% by weight) and peptides with molecular weight of less than 10 kDa (25%) by weight was successfully electrospun into fibres. The viscosity of the feed solution ranged from 200 to 350 m.Pa.s.

Electrospun fibres can also be applied in the packaging industry for carrying antimicrobial ingredients or specific substances from the packaging material into the packed product. It has also been applied as a carrier for pro-biotic bacteria or some other active components which provide antioxidant and antimicrobial properties. Electrospun fibres also have the potential to be used as edible coatings. The application of electrospinning in the food industry is in the stage of infancy. The process is yet to be fully developed and poses challenges in optimizing the process parameters and also the polymers as all the polymers do not have spinning abilities.

References

Brahatheeswaran, D., Mathew, A., Aswathy, R. G., Nagaoka, Y., Venugopal, K., Yoshida, Y., Sakthikumar, D. (2012). Hybrid fluorescent curcumin loaded zein electrospun nanofibrous scaffold for biomedical applications. Biomedical Materials, 7(4): 45001.

Dror, Y., Ziv, T., Makarov, V., Wolf, H., Admon, A., Zussman, E. (2008). Nanofibers made of globular proteins. Biomacromolecules, 9: 2749-54.

Sessa, M., Tsao, R., Liu, R., Ferrari, G., Donsì, F. (2011). Evaluation of the stability and antioxidant activity of nanoencapsulated resveratrol during in vitro digestion. Journal of Agricultural and Food Chemistry, 59(23): 12352-12360.

Technical Session : 4

Interventions for Enhancing Milk Production

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Challenges and Opportunities for Milk Production along the Rural-urban Interface in Bengaluru

By
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Summary of Presentation

While in 1950 about 30% of the world's population lived in cities, this share rose to 54% at present and is predicted to reach 66% by 2050, whereby the annual increase in urban population will likely peak with 1.8% in 2020 and decline to 1.4% by 2030 (Anonymous, 2014; FAOSTAT, 2016; Index Mundi 2017). Major drivers of this urbanization process, which is particularly dynamic in Asia, are better education, infrastructure and income opportunities (pull forces) in urban compared to rural areas, but occasionally also rural insecurity and environmental degradation (push forces). Urbanization also triggers major agricultural land losses near cities, of which in the next two decades 80% will likely occur in Asia (18 Mio ha, of which 7.6 Mio ha will be in China and 3.4 Mio ha in India) and Africa (d'Amour *et al*, 2016).

In India, which is with 123 Mio female cattle and 93 Mio female buffaloes (GoI, 2014) the world's largest producer but also consumer of milk, rapid urbanization has two major consequences: (i) changes in the dietary habits of the growing middle class with a concomitant increase in the demand for animal products,and (ii) raising demands towards the animal sector which comprise increasing consumer expectations on quality of products and concerns about negative environmental and human health impacts related to animal husbandry. It is in this context of multiple human demands on ecosystem services (Cumming *et al*, 2016) that urban cattle production is playing an increasingly conflictive role that reaches far beyond the deep respect in Indian culture for cattle and derived debates. For Greater Bengaluru (Karnataka), informal estimates indicate a rural (51%), peri-urban (34%), and urban (15%) cattle population of at least 8,000-10,000 milking cows. These animals comprise high yielding Holstein Friesian (57%) and Jersey (16%) cows, but also crossbreds (18%) and native Hallikar (9%) cattle. Depending on production intensity and breed milk yield varies widely from 2-30 liters per cow per day. Typically milking animals, kept in or near human homesteads, are fed a high quality diet of locally mixed concentrates (91-98% of the urban dairy farms) and roughages of unknown quality. The

* *This paper was presented by Dr. Andreas Buerkert[1] at Session-4. The co-authors of this paper are Marion Reichenbach[2], Ana Pinto-Garcia[3], Dr. Ellen Hoffmann[1], Dr. Sven König[3], Dr. Raghavendra Bhatta[4], Dr. Pradeep K. Malik[4], Dr. Cadaba S. Prasad[4] and Dr. Eva Schlecht[2]*

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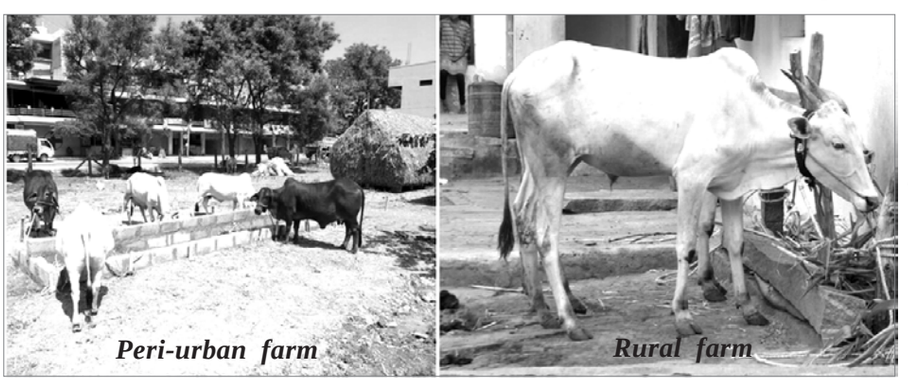
Difference in cattle production systems along the rural-urban interface of Bengaluru

Urban dairy farms in Bengaluru



Peri-urban farm

Rural farm

latter are harvested fresh on public places in or near the city among which many of Bengaluru's lakes and waste water swamps play an important role. About 3% of this milk is directly marketed and provides regular income to cattle owners and their employees, while 2-21% of the remainder are sold via middlemen across the rural-urban interface, or delivered to dairy cooperatives. The cattle farms are often located on the remnants of old agricultural land which has been sold to real estate agents. None of the urban dairy households surveyed was engaged in crop farming while 65% of the peri-urban and 82% of the rural ones were. Under these conditions, major concerns about urban milk production are the indiscriminant disposal of nutrients contained in the manure and poor control of feed-related milk quality.

To enhance the sustainability of these culturally and socially valuable milk production systems in a social-ecological system's context (Ostrom, 2009), both aspects require informed policy decisions based on systematic surveys. These are currently conducted within the inter-disciplinary Indo-German research unit FOR2432 "Social-Ecological Systems in the Indian Rural-Urban Interface: Functions, Scales, and Dynamics of Transition" funded jointly by the Indian Department of Biotechnology (DBT) and the German Research Foundation (DFG).

References

Anonymous. 2014. World Urbanization Prospects. Department of Economic and Social Affairs, Population Division, United Nations. New York, NY, USA. ISBN 978-92-1-151517-6.32p.

d'Amour, C.B., Reitsma, F., Baiocchi, G., Barthel, S., Güneralp, B. Erb, K.-H., Haberl, H., Creutzig, F., and Seto, K.C. 2016. Future urban land expansion and implications for global croplands.Proceedings of the National Academy of Sciences (PNAS) 1606036114v1-201606036. www.pnas.org/cgi/doi/10.1073/pnas.1606036114

Cumming, G.S., Buerkert, A., Hoffmann, E.M., Schlecht, E., von Cramon-Taubadel, S. and Tscharntke, T. 2014. Implications of agricultural transitions and urbanization for ecosystem services. Nature 515, 50-57.

FAOSTAT. 2016. Food and Agricultural Organization of the United Nations, Rome, Italy. http://www.fao.org/faostat/en

IndexMundi. 2017. http://www.indexmundi.com/agriculture/?commodity=cattle.

Ostrom, E. 2009. A general framework for analyzing sustainability of social-ecological systems. Science 325, 419.

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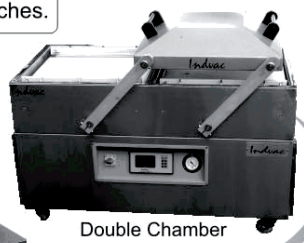

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Technical Session : 5

Health and Life Style Foods for Value Addition

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Speakers:
Dr. Latha Sabikhi, Dr. Shiby Varghese K, Mr. B. Nataraj and Mr. Aditya Kumar Jain

Utilization of Dairy Ingredients in Convenient and Shelf Stable Health Food Formulations for Armed Forces*

By
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Abstract

Armed Forces have to operate in a variety of challenging environments including difficult terrains, high altitude, underwater, confined space, air and hot humid environments. The troops operate above 13,000 feet and at areas such as Siachen glacier, the operation altitude goes up to 23,000 feet. The conditions include hypoxia and very low temperature wherein human physiology is adversely affected. Therefore while offering specific operational MREs (meals ready to eat) for various terrains/weapon platforms and combat theatres such as low intensity conflicts, it is highly important to keep in view the operational requirements in terms of food logistics and also the adverse effect caused by the extreme environments on human physiology and also the psychological aspects. Each terrain has specific requirements and the same needs to be addressed by the food to mitigate the adverse effect. Convenience and special nutrition are of utmost importance in developing shelf stable food products for the Armed Forces. Various performance enhancing functional products have been developed with incorporation of dairy ingredients. Dehydrated chicken cubes, freeze dried probiotic pineapple lassi powder, whey protein enriched grape juice powder and various whey-fruit based energy drink mixes are some of these hybrid products where functionality and texture/consistency improvement have been achieved by the use of dairy components.

* *This paper was presented at Session -5. The co-authors of this paper are Dr. Aisha Tabassum and Dr. M.C.Pandey from Freeze Drying and Animal Products Technology Division, Defence Food Research Laboratory, Siddharthanagar, Mysore.*

Whey-fruit based Energy Drink mixes

Health drinks are formulated taking into account the nutritional requirements or recommended dietary allowances for the target group. It is not only essential to balance the energy, protein and vitamin requirements, but also to make the drink palatable, sparkling and thirst quenching. Energy drinks and sports drinks are distinctively different products (Amendola *et al*, 2004). However the terms are often used interchangeably. While sports drinks are mainly designed to replace fluid and to provide carbohydrates, energy drinks are marketed for their mental stimulant effect. Ingredients like caffeine, taurine, glucuronolactone are distinctive for energy drinks as they are not present in sports drinks. Energy drinks represent a relatively new category of beverages that contain caffeine in amounts

that exceed those in soft drinks and approach the low end of concentration range found in coffee (Magkos and Kavouras, 2005). A number of scientific reports during the first half of the twentieth century have provided considerable evidence that caffeine may enhance exercise capacity and recovery from fatigue; they attributed these effects mainly to its central stimulating actions. Available evidence from controlled experiments confirm that caffeine can indeed be an effective ergogenic aid over a wide range of athletic activities involving both aerobic and resistance types of exercise.

Nutritional beverages are formulated to provide specific nutrient combinations to individuals with special dietary needs, e.g. sports drinks for athletes, meal replacement drinks for dieters, meal replacement drinks for general adults, low sugar drinks for diabetics and infant formula for non-breast-fed babies. Consumer acceptance of these products depends on the development of nutritional beverages that maintain their desirable appearance, texture and flavour characteristics during storage and consumption. Consumer preference is towards the clear beverages with no whey protein sedimentation or precipitation (Singh *et al*, 2001).

In order to meet the requirements of soldiers in combat environment, freeze drying was used for the development of shelf stable, light weight, readily reconstitutable energy drink mixes rich in antioxidants. Two energy drink mixes containing varying proportions of whey and fruit juices have been formulated with the help of D-optimal mixture design. The study characterised the energy drinks formulated with whey-grape juice and whey-pomegranate juice with incorporation of carboxy methyl cellulose, caffeine and sugar. Acidity of the mixes was mainly controlled by the proportion of whey and fruit juice. Mixture design was found to be a beneficial tool in product development with high degree of prediction accuracy for the responses.

The energy drink mixes developed were found to be light weight, more porous structure with minimum shrinkage, instantly soluble and good in colour. At the level of 200 ppm, caffeine did not impart any adverse effect on the taste or flavour of these energy drink mixes.

The freeze dried mixes based on whey-grape juice and whey-pomegranate juice were shelf stable for 9 and 8 months respectively in PFP laminates and can be used for the benefit of soldiers working in combat environment. The whey-fruit based energy drink mixes were rich in antioxidants, viz. anthocyanins and ascorbic acid.

Instant mixes containing WPC for performance enhancement

High protein grape juice powder

Varying levels of Whey Protein Concentrate (WPC), maltodextrin (MD) and sugar were used in formulation. The optimization of ingredients was achieved using response surface methodology. Grape juice supplemented with 15% WPC, 2% MD and 8.5% sugar was found to have maximum acceptability. The high protein grape juice was freeze dried after adjusting the total soluble solids content to desired level and the freeze dried mix had good colour, light weight and was instantly soluble in water. The high protein drink mix packed in paper/Al foil/polythene (PFP) pouches was stored at ambient temperature as well as 37°C. Periodic evaluation (2-months interval) revealed that the nutritional high protein grape juice mix was stable for a period of 1 year under ambient conditions and for 8 months at 37°C. The freeze dried mix on reconstitution had a protein content of 6g per 100ml and energy value of 83.6 Kcal/100ml. The freeze dried mix had anthocyanin content of 95 mg/100g and vitamin C content of 140 mg/100g.

High protein pineapple lassi powder

This is a carbohydrate-protein beverage mix which combines the health benefits of pineapple and a fermented dairy product. Whey protein is used as a functional ingredient for improved physical performance and exercise recovery. Studies were carried out to evaluate the effect of varying levels of WPC on physico-chemical properties of high protein pineapple juice powder and it was found that the functional ingredient suits the sensory acceptability of the product with no adverse changes in its colour, flavour and overall acceptability. Pineapple lassi powder obtained using freeze drying technology with incorporation of WPC is light weight, easily reconstitutable, instant drink mix suitable for consumption by soldiers in combat environment. The powder has superior physical properties and nutritional benefits due to high protein content and quality due to incorporation of WPC. Hygroscopicity of samples containing WPC (6%) was significantly lower than plain pineapple lassi powder at different relative humidities. The product is also a rich source of vitamin C with good antioxidant activity. There was 95% and 91% retention of Vitamin C in samples stored at RT and 37°C respectively. The product was found to be sensorially

acceptable during the 10-month storage study carried out. The freeze dried pineapple lassi powder with whey protein on reconstitution (30%) gives a protein content of 6.6 g per 100ml.

WPC as a functional ingredient and texture enhancer in dehydrated chicken cubes

Texture is an important parameter which defines the commercial value of meat and meat products. Texture and tenderness are rated as the most important of all the attributes of eating quality (Lawrie, 1998). Texture of meat is strongly dependent on the meat protein level (Pietrasik and Shand, 2003). Meat protein ratio (MPR) expresses percentage moisture divided by percent protein and is commonly used to classify dried sausages and other meat products. Chicken cubes containing different salt combinations had MPR of ≤ 1.9:1 as specified for shelf stable dry sausages. Salt concentration has an influence on the texture of the product (Arnau, 1991). Physical methods of measuring texture include the following; measuring the shear force (Warner, 1928), penetration force (Tressler *et al*, 1932), force required to cut (Miyada and Tappel, 1956), force required to puncture, compression force and tensile force. Ruiz de Huidobro (2005) reported that the texture profile analysis (TPA) method is the best predictor of sensory texture for bovine meat. The Warner-Bratzler shear test measures the force necessary to shear a piece of meat, whereas TPA measures the compression force. A good understanding of physico-chemical, structural and functional properties of milk proteins under addition of salts is not only momentous for fundamental research but also for the improvement of meat products in which functional dairy proteins are incorporated in combination with salts.

Whey proteins are among the most employed and versatile source of functional and nutritional food proteins.Whey protein concentrate is a promising additive for fat replacement, good water binding and improved textural quality of dehydrated chicken cubes. Extended chicken cubes containing WPC obtained using different drying methods [freeze drying (FD), vacuum drying (VD), solar drying (SD) and hot air drying (HAD)] having water activity less than 0.5 are shelf stable products. The residence time, bulk density, colour and rehydration ratio also varied significantly ($p \leq 0.05$) with the drying method employed. Final moisture content and water activity values were highest for SD and least for FD samples. The bulk density was highest for SD sample followed by VD, HAD and FD. Freeze dried samples exhibited highly porous microstructure, solar dried had a flaky appearance. VD samples had a fibrous micro structure and HAD samples showed more compact continuous protein network with small pores. Vacuum dried chicken cubes were comparable to freeze dried samples in terms of rehydration properties and showed similar moisture adsorption behaviour. From our studies, it could be concluded that vacuum drying could be adopted successfully for the development of shelf stable chicken cubes with quality comparable to that obtained via freeze drying and better than hot air dried and solar dried cubes.

Phytonutrient enriched beverage mixes

Avocado milk shake powder

Avocado is the only fat-rich fruit which provides a high percentage of monounsaturated fatty acids, mainly oleic acid. It also provides phytosterols such as beta sterol, campesterol and stigmasterol. This special group of fats is known to have anti-inflammatory properties. Fruit extracts contain considerable amounts of Vitamin A, B2, C, K folic acid, lutein zeaxanthin and Beta carotene. One half of avocado (68g) provides dietary fibre (4.6 g), potassium (345mg), lutein/zeaxanthin (185µg), phytosterols (57mg) and 114 kCals. Avocado pulp can be used as a fat replacer in many dairy products such as icecream for positive health benefits.

Avocado milk shake powder is a light weight product containing avocado as a source of healthier fat and phytonutrients. The challenge in processing avocado, an underutilised tropical fruit, is its susceptibility to browning and heat induced bitterness. Considerable research work was carried out to screen avocado varieties for processing based on yield, physico-chemical composition and susceptibility to browning. Pear-shaped variety selected was subjected to cold processing, and maltodextrin at various levels was added to reduce bitterness and stickiness in the product. Different drying methods were investigated and spray drying was found to be more effective in reducing bitterness, probably due to better encapsulation of the bitterness causing oxylipins in the fat portion of the fruit pulp. Physico-chemical, thermal properties and sorption behaviour of freeze dried and spray dried powders were also characterised.

Probiotic products for high altitudes

Probiotic pineapple lassi powder

Requirements for carbohydrates and vitamins are

high in cold regions and high altitudes for the production of sufficient energy for thermo genesis. Carbohydrates help in replacing depleted muscle glycogen stores, and they require less oxygen for metabolism. All of the water-soluble vitamins, with the exception of folic acid and vitamin C, are intimately involved in the oxidation and conversion of food to energy. To overcome the oxidative stress associated with decreased oxygen pressure at high altitudes, light weight carbohydrate-rich products which can act as rich source of B-vitamins are specifically suitable to meet the enhanced nutrient requirements at high altitudes and probiotic organisms capable of producing these vitamins are identified. Freeze drying technology and suitable packaging ensure that the viability of vitamin producing organisms is maintained above the therapeutic minimum till the time of consumption.

Freeze dried probiotic pineapple lassi powder containing *Bifidobacterium bifidum* (NCDC 235) contains 2% moisture, 10% fat, 12% protein, 74% carbohydrate, 1.57% ash and 2.23% crude fibre. The energy value of the FD probiotic pineapple lassi is 434 kcal/100g. The reconstitution level is standardized as 30g of freeze dried powder in 100ml water based on its consistency and overall acceptability. 100ml serving of reconstituted product gives 2mg thiamin (2/3rd of suggested micronutrient intake goal for high altitudes), 2.27mg niacin , 0.375 mg riboflavin and 67.5mg pyridoxine. *Bifidobacterium bifidum* count is up to 10^8 cfu/ml when stored at room temperature and frozen conditions for 12 months. The product remains acceptable and free flowing for 8 months at room temperature and 12 months at -18^{o}C and is suitable to overcome physical exertion in extreme cold conditions.

Conclusion

The research area of functional fruit ,dairy and meat based products is interesting and the work carried out so far has resulted in a basket of functional products for armed forces deployed in difficult terrains. Though the research focuses mainly on the targeted needs of Services, the spinoff benefits can reach the civilian sector also. In the modern era, where consumers are looking for convenience, functional benefits and long shelf life in food products, these categories of instant beverage mixes and dehydrated meat products have a special place in the market. Though capital investment is high, freeze drying offers superior quality product in terms of colour, flavour, rehydratability and bioactive retention. Freeze dried products are next to fresh in quality attributes. Many food companies are in a position to afford high cost equipments and there are big players like ITC Ltd., General Mills and Haldiram venturing into export quality diverse food products. The freeze dried products will be a boon to society that lacks time for extensive preparations and elite consumers who are on the lookout for high quality products. The utilization of dairy ingredients in these products contribute towards their performance enhancement attributes and improved sensory appeal.

References

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Food Innovation and Regulations*

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India ranks no. 1 in the world in the production of milk, ghee, ginger, bananas, guavas, papayas and mangoes. Further, India ranks no. 2 in the world in the production of rice, wheat and several other vegetables & fruits. The annual growth rate of the food processing industries sector during 2015-16 was 7 per cent as compared to around 4.90 per cent of agriculture and 8.06 per cent of manufacturing. The food processing sector constitutes as much as 8.80 per cent of GVA in manufacturing and adds 8.39 per cent to the GVA of the agriculture sector. This sector is also important for addressing critical issues of food security, food inflation and providing wholesome, nutritious food to the masses. Lack of product development and innovation has been recognized as one of the challenges facing the Indian food processing sector (Annual Report 2016-17, Ministry of Food Processing Industries, Government of India).

Innovation — an important driver of industry's growth

Food availability and its quality/safety constitute the fundamental requirements for a food industry to create consumer demand leading to competition, growth and revenue. Food innovation is increasingly being recognized as an important element that acts as a catalyst for the growth of the food industry. In other words, innovation is a growth stimulant for the food industry (**Fig. 1**).

Food innovation can be presented as introduction of a new food and/or improvement in any aspect of an already existing food that satisfies and/or delights consumer. Consumer requirements are determined by a complex combination of various dynamic and interacting factors (**Fig. 2**).

The key to a successful innovation is to design a product that delivers on one or more of these requirements. Innovation is, of course, a consumer-centric activity.

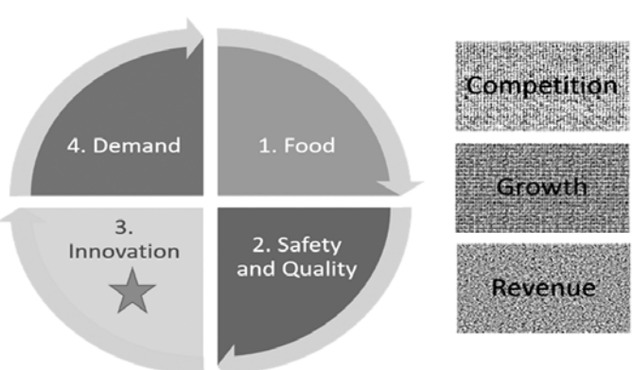


Fig.1 : Food Industry Drivers

** This paper was presented at Session -5.*

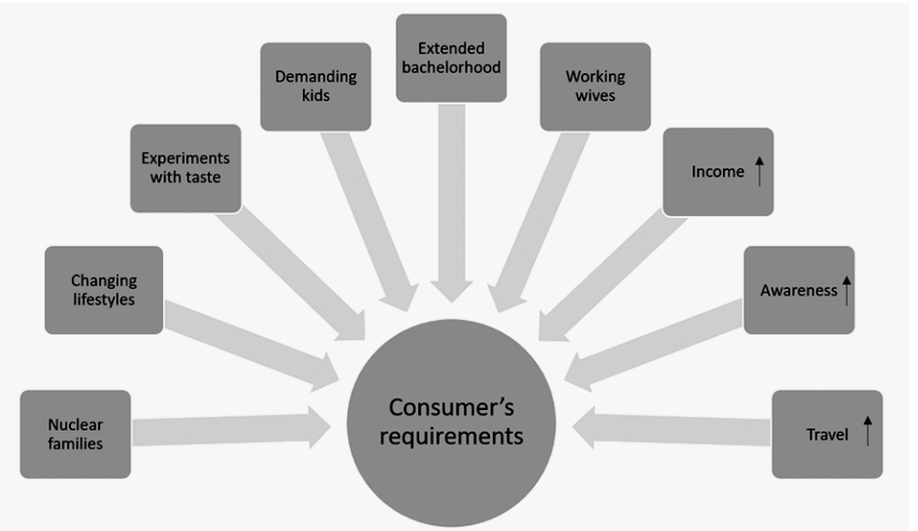


Fig. 2 : Complex Consumer Requirements

Food innovation has always been taking place, sometimes without conscious efforts, throughout the evolution of human civilization. It is now effected in a more structured manner with ideation and use of science and technology, and it has become imperative for any food business to be successful in the increasingly competitive business environment.

Aspects in food innovation

Food innovation can take place in any stage of food chain and encompasses everything from creating new variants, combinations, balancing of nutrients' content and/or type, tailor-made foods for specific populations, use of novel ingredients, etc.(**Fig. 3**).

Food standards and regulations

Food standards and regulations are the objective expressions of requirements aimed at facilitating a clear and effective communication of expectations/ requirements among stakeholders (business, regulator and consumer/ customer) in the food chain. Food safety, quality, fitness for intended use and commercial ethics are important dimensions of such requirements/expectations. While the consumer may not be the expert on all these dimensions, she has the right to the food that meets all her requirements — stated or implied. Food standards and regulations are intended to facilitate this.

The extant food regulations that are specifically relevant to food innovation are established by the Food Safety and Standards Authority of India and are listed in **Fig. 4**.

Of these, the most important regulation with respect to food innovation is the Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 as amended from time to time. Its salient features are shown in **Fig. 5**.

Innovation often challenges the existing boundaries of food regulations. Hence, it has always been a balancing act to be able to innovate without violating the existing regulations or, conversely, to get in place regulations that accommodate innovations in foods through a built-in flexibility and/or rapid and appropriate response to

Fig. 3 : Different Aspects in Food Innovation

Food Innovation Aspects

Any stage in food chain

- **Food production** - Pasture fed, Organic products, biofortification
- **Food designing** - Ingredients, additives, packaging
- **Food processing** - Pasteurization – Pulsed electric field, ionizing radiation, ultraviolet radiation, high hydrostatic pressure
- **Food packaging** - Standing pouches (convenience), Antifungal coating (preservation), Easy opening
- **Marketing/Consumer education** - Importance of food components in diet, claims.

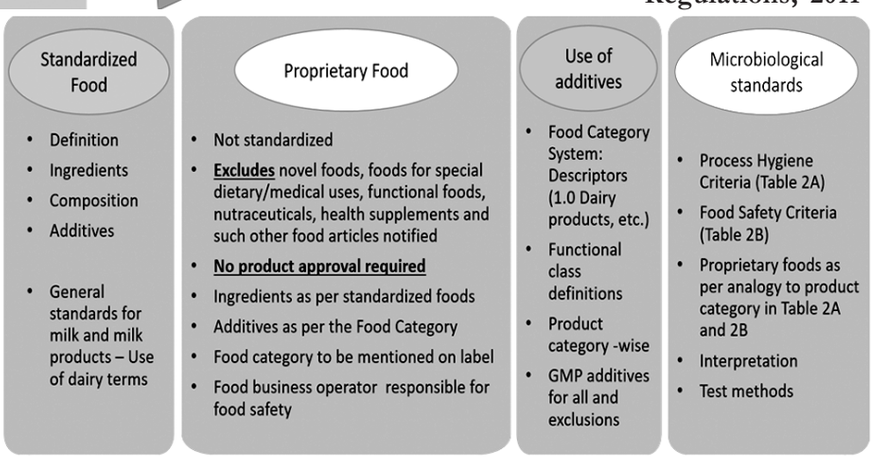
Different objectives

- **Creating variety** – new flavours, new combinations (composite foods)
- **Balancing nutrients** – increase / decrease / eliminate / incorporate
- **Foods for targeted populations** – Elderly, children
- **Fun component** – Crackling chocolate, bursting candies
- **Functionality** – Probiotic, gaining/reducing weight, hypoallergenic
- **Novel ingredients** – Bioactive from colostrum
- **Analogues** – Replacing milk fat/protein with vegetable fat/protein
- **Shelf – life** enhancement
- **Specific aspects** – Organic, vegan, natural, origin, raw

One or more

Fig. 4: Food Regulations Relevant to Food Innovations

Fig. 5: Salient features of the Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011



the innovatory developments.

Recent developments on the front of food standards and regulations - such as doing away with the requirement of prior approval of proprietary products, allowing use of a large number of safe food additives in all foods as per the Good Manufacturing Practices (without specified maximum use levels), clarity on use of additives with numerical maximum levels etc. are likely to encourage food innovations.

Conclusion

A consumer who is ready to experiment with taste and has the capacity to pay for innovative foods, a food/dairy industry that recognizes the need for innovations and food standards/regulations that are accommodative of innovations is all it takes for food innovations to become reality. All this appears to exist currently in our country. In innovating meaningfully, however, the following needs to be observed:

Food businesses should

- innovate ethically; and,
- participateactively in the standards/regulations development process.

Food regulator should remain

- abreast with the latest in the field of food innovations and prepared to address the same; and,
- responsive to the innovation needs of the food businesses.

Consumer should

- make informed choices;
- handle/consume the product as intended; and,
- remain informed of the extant food regulations.

Food business, food regulator and consumer should collaborate.

Acknowledgements: I would like to thankfully acknowledge the help extended by my colleagues Shri Harendra Pratap Singh, Shri Vishal Trivedi, Ms. Lalita Oraon and Ms. Ketan Dave for their help in preparation of this article and the related presentation made during the 46th Dairy Industry Conference, 8-10 February 2018, Kochi.

Disclaimer: The views expressed are of the author and do not necessarily reflect the views of the National Dairy Development Board. The information provided is by no means complete.

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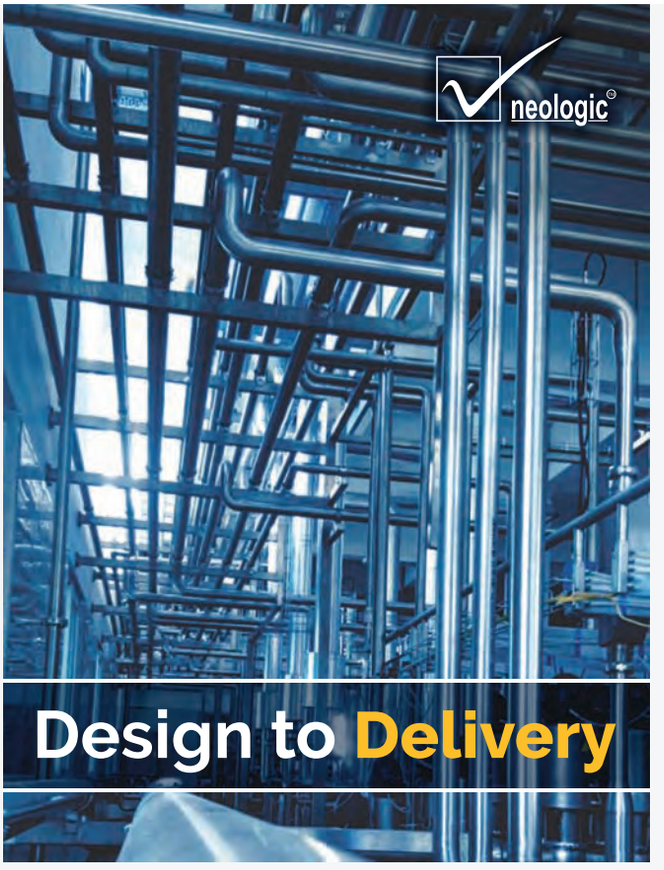

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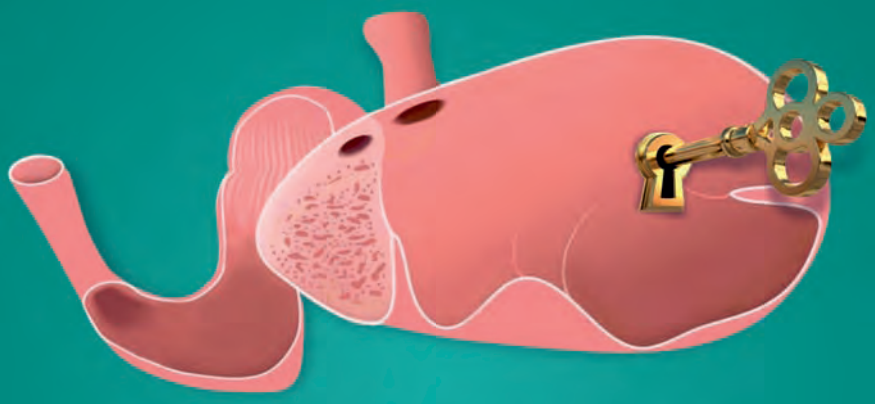

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Stevia (Meethi Tulsi), a Natural, Sustainable, Non-caloric Sweetener for Food Applications*

By
Dr. Siddhartha Purkayastha
PureCircle USA
Chicago, Illinois
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Abstract

Consumers' desire for natural ingredients and 'clean' labels has contributed to the growth of the stevia leaf extract as a sustainable, plant-based zero-calorie sweetener to reduce sugar in food and beverages without sacrificing the taste. A key benefit of using stevia as an ingredient is its ability to claim the naturalness of steviol glycoside content that remains intact during the commercial extraction and purification process. The stevia leaf contains more than 50 steviol glycoside compounds that have diverse sweetness and taste profiles, but they share the same metabolic fate. The stevia sweetener has been found safe for consumption for all age groups and special populations including diabetic people, pregnant women, and children.

Major regulatory bodies approved the high-purity stevia leaf extract for use around the world today and the consumer insight data around the globe support the natural and healthy association of sweet molecules from the stevia plant. Stevia can be found in more than 16,000 food and beverage products globally, including beverages, dairy products, baked goods, cereals, salad dressings, sauces, confections, tabletop sweeteners, and more.

* *This paper was presented at Session - 7.*

Introduction

With the ever-rising awareness of the impact of food and lifestyle on health and wellbeing, consumers are looking for natural ingredients and 'clean' labels for their choice of food and beverages. Companies have adopted stevia to meet challenges with reducing calories, but maintaining great taste in their products. However, the designation of natural ingredients can vary significantly depending upon the country or region. To better understand the naturality of steviol glycosides, sweet molecules in the stevia leaf, it is important to understand the stevia plant's origin and how it is processed, how the stevia leaf extract is regulated, and how food and beverage companies are utilizing the plant-based ingredient in their products.

The stevia leaf contains a large number of functional compounds, such as plant glycosides including steviol glycosides and other terpenoids, polyphenolic compounds like chlorogenic acids, quercitrin and other antioxidant compounds. There are more than 50 steviol glycosides found in the stevia leaf. Each of these steviol glycosides has its own taste profile and sweetness intensity, which can be up to 400 times sweeter than sugar. However,

all of them contain a common steviol backbone conjugated with different sugar moieties and share a same metabolic fate. The extensive scientific data on metabolism and toxicology of steviol glycosides show that stevia sweeteners are safe for all age groups and special populations including children, diabetic and pregnant women.

Origin and Use of Stevia

Stevia is a perennial shrub that grows up to 1 m tall and has leaves 2-3 cm long. It is a non-GMO plant with sweet leaves and belongs to the Aster family. Though as many as 200 species of stevia are native to South America, no other stevia plants have exhibited the same intensity of sweetness as *Stevia rebaudiana.* Indigenous people in Brazil and Paraguay, especially Guarani Indians, have used stevia leaves to sweeten their yerba mate tea for centuries. In the sixteenth century, Europeans first learned about stevia from conquistadores that the natives of South America were using the plant to sweeten herbal tea (Taylor, 2005). Today the stevia plant is grown in Brazil, Paraguay, Kenya, China, India and the United States among other regions. Reportedly, the stevia leaf has been used in herbal medicine and Ayurveda preparations in India and named as "Meethi Tulsi," "Misti Tulsi," "Meethi Patta," etc.

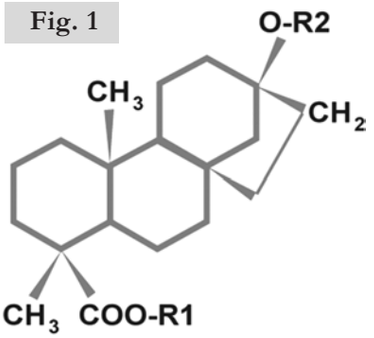
Currently, stevia sweetens over 16,000 products around the world. In 2016 alone, close to 3,000 products were launched globally with stevia, with the beverage category growing by 20 per cent, and the food category growing by 9 per cent.

China grows more than 80% of the global stevia leaf supply. Since stevia is becoming the preferred zero-calorie sweetener among consumers and consumer product companies, diversification of the stevia leaf sourcing is critical for the stevia industry. Stevia farming can provide economic opportunities for India's farmers looking for a sustainable crop, which is in high demand by the global food and beverage industry. Since stevia requires 1/5th land compared to sugarcane to provide same sweetening power and a modest water supply, Stevia can be a sustainable cash crop grown in commercial scale in different Indian States. Stevia farming can provide Indian farmers significantly higher income/Ha compared to the major agricultural and horticultural crops cultivated in India.

Stevia Leaf Extract

The stevia leaf contains a large number of polar and non-polar compounds with more than 100 phytochemicals, rich in terpenoids and flavonoids (Taylor, 2005). At least 50 different steviol glycosides (diterpenoides) have been identified in the leaves of *S. rebaudiana* (Ohta *et al,* 2010; Chaturvedula and Prakash, 2011a, b; Chaturvedula *et al,* 2011a-c; Ceunen and Geuns, 2013, JECFA, 2017). They all share the same steviol backbone connected to different sugar moieties (R1 & R2) as shown in the molecular structure (**Fig. 1**).

Fig. 1



R1 & R2 have one or more units of either glucose, xylose, rhamnose, and/or other sugar moieties.

Stevia leaf extracts (steviol glycosides) are prepared by water extraction and followed by several physical separation steps (**Fig. 2**) to remove other compounds in the leaf, such as organic acids, antioxidants, plant glycosides and non-polar compounds. These compounds are removed through separation steps as outlined in **Fig. 2** to obtain the purity of steviol glycosides to meet regulatory requirements.

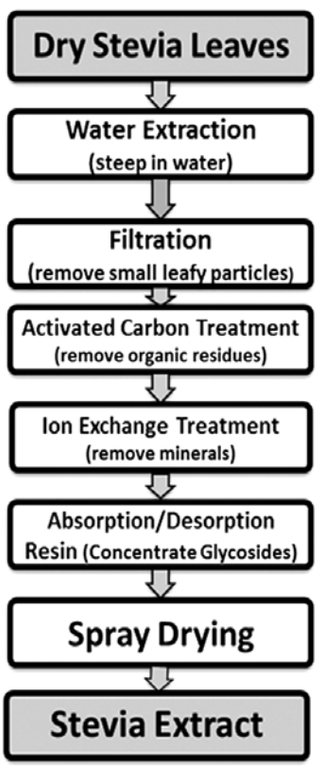


Fig. 2

This process produces the purified stevia leaf extract, which is approved by major regulatory bodies for use in foods and beverages around the world. The purified stevia leaf extract may pass through multiple crystallization steps to enhance the purity of one or more specific steviol glycosides. The processing steps employed for purified steviol glycosides are like other ingredients from nature, such as cane sugar (**Fig. 3**).

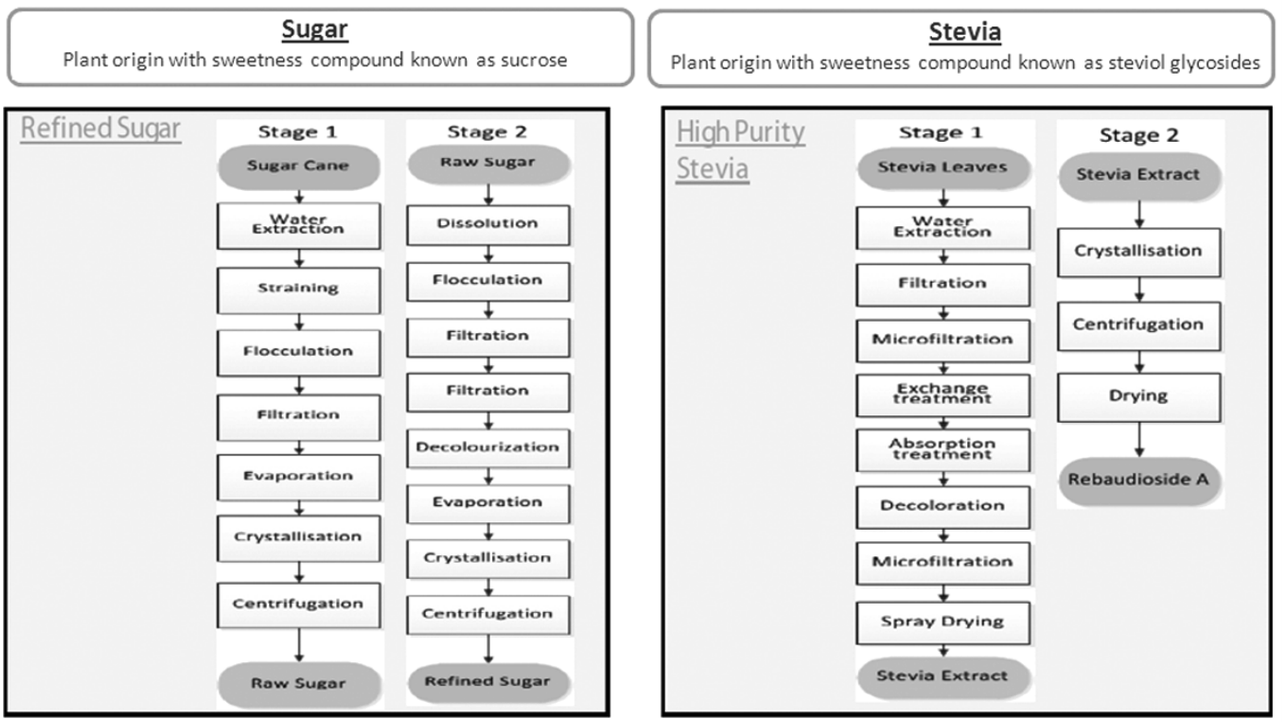


Fig. 3: Stevia Sweetener from Stevia leaf shares the similar separation steps as used in sugar manufacturing from sugarcane

In a recently published study in *International Journal of Food Science and Technology*, the researchers from the University of Bonn, Germany, found that the sweet components present in the leaves of the stevia plant are not altered during the extraction and purification process to make high-purity stevia extract (Oehme *et al,* 2017).

Oehme *et al* (2017) systematically determined whether steviol glycosides were modified by the typical commercial extraction and purification processes used to obtain high-purity steviol glycoside sweeteners. The study investigated whether commercial-scale extracted and purified steviol glycosides contain the same steviol glycoside distribution that is found in starting leaves and the first water extract of stevia leaves, focusing on the nine steviol glycosides specified in the JECFA (2010) specification.

Samples of three independent commercial-scale batches of stevia leaf, provided by PureCircle (Malaysia), were examined in the study. Each batch contained the original dried stevia leaf (SL), the first water extract (ESL), and a final 95 per cent purity stevia leaf extract (SLE95) end-product.

Results showed the commercial powders of extracted steviol glycosides contained the same nine steviol glycosides analyzed as the dried stevia leaves and their hot water extracts. Additionally, the distribution pattern from the three very different stages of the process clearly demonstrated that the processing steps do not modify the nine-steviol glycosides examined (**Fig. 4**).

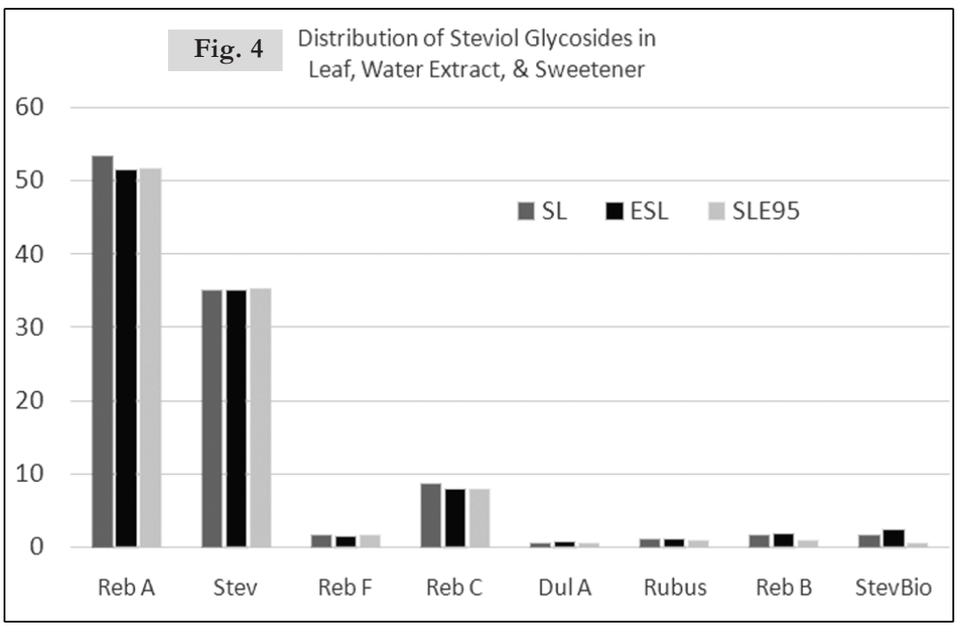
Metabolism of Steviol Glycosides

Steviol glycosides (steviol conjugated with glucose, xylose, rhamnose, and/or other sugar moieties) are natural constituents of the *Stevia rebaudiana* plant. Steviol glycosides pass undigested through the upper gastrointestinal tract to the colon, where they are hydrolyzed by gut microbiome (mainly bacteroides family) to aglycon steviol by sequential removal of one sugar moiety at a time. The resulting aglycon steviol is absorbed and transported through portal vein to liver for rapid conjugation with glucuronic acid to form steviol glucuronide, which is eliminated by humans in urine (Wingard *et al,* 1980; Hutapea *et al,* 1997; Gardana *et al,* 2003; Koyama *et al,* 2003; Geuns *et al,* 2003, 2007; Renwick and Tarka, 2008; Purkayastha *et*

al, 2015).

Studies using human fecal homogenates have demonstrated that the nature and number of the sugar moieties present, or the types of linkages that connect the sugar moieties, does not alter the metabolism in any qualitative way. All steviol glycosides are hydrolyzed to the common metabolite steviol (Purkayastha *et al,* 2015, 2016). Since steviol glycosides do not get absorbed in the upper GI tract, stevia is a zero-calorie sweetener.

Fig. 4 Distribution of Steviol Glycosides in Leaf, Water Extract, & Sweetener



Safety & Regulatory Approval of Steviol Glycosides

The high-purity stevia leaf extract is approved in all major countries, and over 200 studies support stevia's science and safety of purified steviol glycosides. These studies present biological, toxicological, and clinical data assessed by a number of reviewers (Carakostas *et al,* 2008; Geuns, 2003). The body of scientific evidence supports that the purified stevia leaf extract has no adverse effects in humans and is safe for the general population at the levels used in foods and beverages. Research has also shown that the purified stevia leaf extract is safe for consumption by special populations including pregnant women, lactating mothers, and children. Furthermore, long-term carcinogenicity studies show that the purified stevia leaf extract consumption is not associated with increased cancer risk.

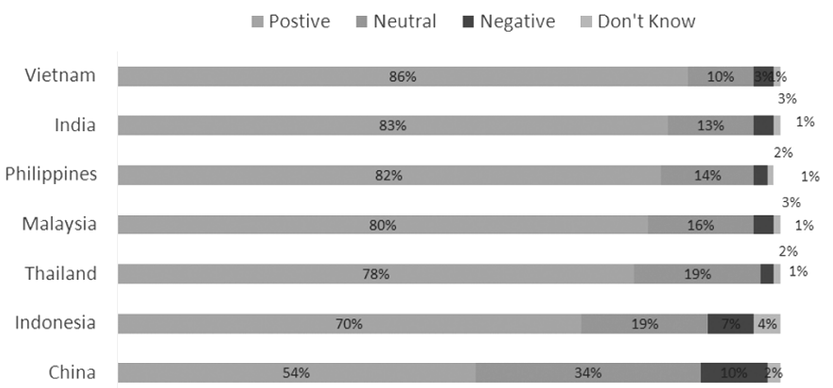
All steviol glycosides derived from Stevia leaf have US GRAS (Generally Recognized as Safe) status, and have been approved by Health Canada, Food Standards Australia New Zealand (FSANZ), and most recently by the Joint Expert Committee on Food Additives (JECFA). While the European Food Safety Authority (EFSA) is evaluating the approval of all steviol glycosides, the EFSA currently specifies the use of 11 steviol glycosides (Reb M and Reb E included) in the high-purity stevia leaf extracts. Several other countries and regulatory authorities have declared the stevia leaf extract a natural sweetener or a sweetener from a natural source.

Recently the World Health Organization, Europe (2017) classified sweeteners as non-caloric and caloric sweeteners; non-caloric sweeteners can be natural or artificial. Natural sweeteners include stevia. Malaysia's regulatory authority amended the Food Regulation in 2004 to include stevia extract (Reg 118A) in the sweetening substances from plant that includes sugar, soft brown sugar, rainbow sugar and dextrose. In 2012, the Health Ministry of Indonesia divided Pemanis (sweetener) group into Pemanis Alami (natural sweetener) and Pemanis Butani (artificial sweetener). Pemanis Alami includes steviol glycosides. The Korean Food Additive included the stevia extract under "Natural Food Additive". Stevia sweeteners can be claimed as stevia leaf extract or sweetener from a natural source in major markets.

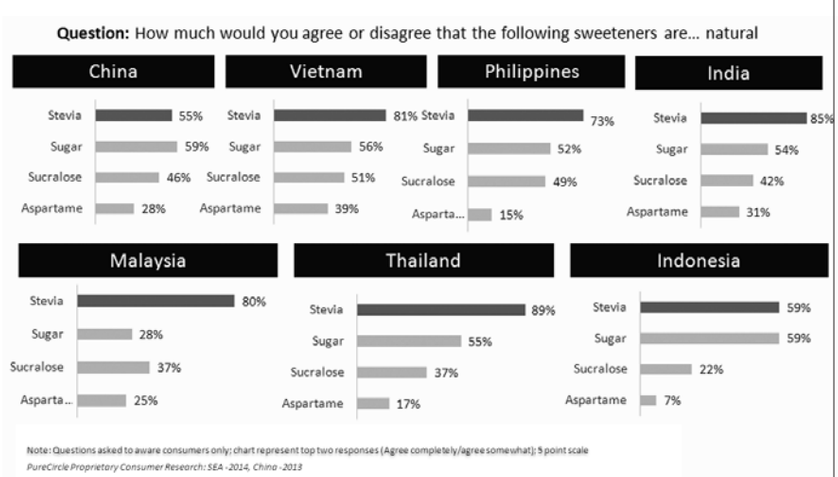
Perceptions of Stevia

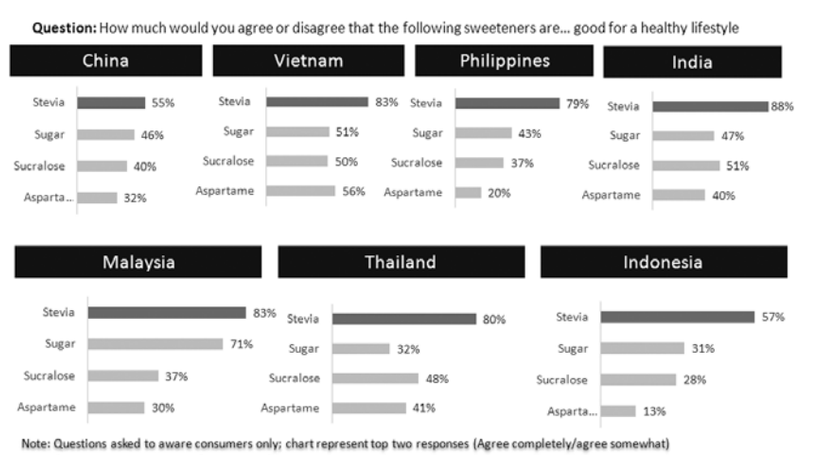
Consumers generally have a more positive impression of natural sweeteners and group stevia among them. Across markets, stevia outperforms sugar and artificial sweeteners in perception of naturalness. Stevia also outperforms sugar and artificial sweeteners in perception of being good for a healthy lifestyle (**Fig. 5**). In fact, consumers believe that stevia delivers on being natural as well as many other key ingredient attributes. For instance, in Mexico more than half of consumers agree that stevia supports a healthy lifestyle, provides great taste, is natural and is safe for children and adults alike. In a 2014

Fig. 5 Overall Impression of Stevia, Among Aware Consumers



PureCircle Proprietary Consumer Research: SEA -2014, China -2013





consumer study conducted by PureCircle, impressions of stevia were overwhelmingly positive across several Asian markets including Vietnam (86%), India (85%), the Philippines (82%), Malaysia (80%), Thailand (78%), Indonesia (70%) and Singapore (57%) among aware consumers.

Innovation in Stevia Use in Dairy Foods

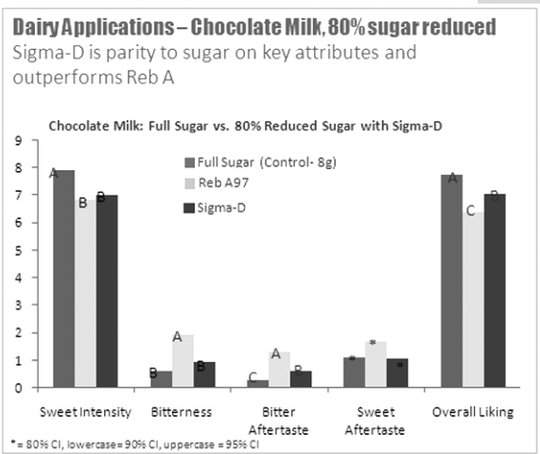
Taste is the most critical determining factor in reducing sugar with stevia sweetener. The selection of stevia sweetener and combination of steviol glycosides in any food formulation is dependent on multiple factors – level of calorie/sugar reduction, matrix/application, and flavour specificity of steviol glycosides – in the most closely replicating desired sweetness perception. Stevia requires category approach due to interactions with matrix pH, flavours, and synergies with other components. Research shows (**Fig. 6**) that a blend of selected steviol glycosides (Sigma-D of PureCircle) can provide a better sweetness profile and reduced non-sweet taste compared to the use of a single molecule (Reb A) sweetener.

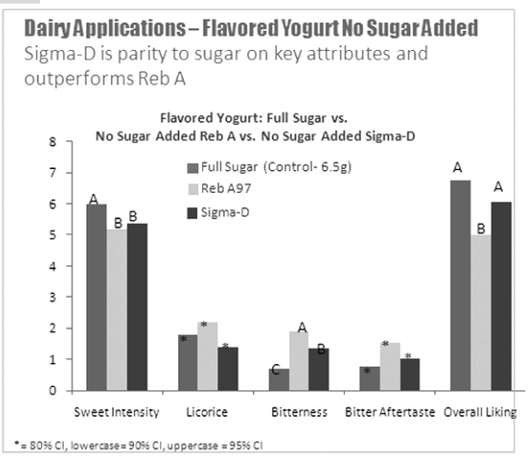
Across key dairy categories, stevia launches continue to post strong growth. The dairy product launches with stevia sweeteners showed a five-year (2013-17) CAGR (cumulative average growth rate) of 25%. The growth rates are 37%, 22% and 20% in flavoured dairy drink, drinkable yogurt and spoonable yogurt, respectively. The highest growth was in plant-based beverages (alternate dairy) around 44%. The growth rate has been evenly distributed across regions with Asia Pacific and European/Middle east markets growing more than 30%.

Labeling of Stevia Sweetener

Food and beverage companies are using stevia to help create great-tasting food and beverage products with fewer

Fig. 6





total calories. On the ingredient label, stevia sweetener is listed in several forms: stevia, stevia extract, stevia leaf extract, Rebaudioside A, Reb A, steviol glycosides and other variations depending on the country and the manufacturer.

Common claims food and beverage companies make on their products containing stevia include all natural, naturally sweetened, natural origin and no artificial sweeteners among other designations. Health Canada has approved Stevia Leaf Extract as a label for steviol glycosides from the stevia plant. The stevia leaf extract is also widely used as an ingredient label for a wide range food and beverage products in the US, Australia and Latin American markets.

Conclusion

Steviol glycosides derived from the stevia plant have the same molecules, which exist in the leaf. The physical process employed during the production of steviol glycosides does not change the chemical structure of steviol glycosides. Stevia sweetener is approved globally and it is safe for consumption by all age groups and special populations. Consumers as well as food and beverage companies are increasingly recognizing this powerful, plant-based ingredient for its potential in a competitive marketplace.

References

The author may be contacted through email for references.

Technical Session : 8

Quality - The Ultimate Settler

Chairman:

Dr. Satish Kulkarni

Co-chairman:

Dr. N. Sankaran

Convener:

Dr. P.K. Srivastava

Rapporteur:

Dr. Aparna Sudhakaran V

Speakers:

Mr. Sunil Bakshi, Dr. Rajan Sharma, Dr. D.K. Sharma and Mr. Sham S. Chaudhry

Technical Session : 9

Skill and Human Resource Development

Chairman:
Dr. G.R. Patil

Convener:
Mr. Bache Gowda R

Rapporteur:
Mrs. Smitha J Lukose

Speakers:
Dr. Sudhir Uprit, Dr. Satender Arya and Dr. M.K. Salooja

Driving Dairy Education from Sufficiency to Efficiency through Innovative Interventions*

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Dairy technology offers a promising option for value addition and resource mobilization in terms of availability of dairy products for consumers and increased returns at the producer and the processor level. The Indian dairy sector is generating new jobs to the tune of one lakh every year. There is immense scope for this industry to grow further in view of globalization and increasing purchasing power of consumers.

Procuring milk of appropriate quality and handling it till it reaches the processing plant requires well trained personnel. Dairy Science and Technology graduates have the potential of handling these issues effectively. At present there are as many as 22 Dairy Science Colleges in the country. However, availability of skilled manpower is still a cause of concern. In one study, it is pointed out that the availability of skilled manpower in the dairy industry is inadequate. Respondents from private and public sectors feel that there is a gap in the demand and supply of research personnel for development of new products.

Challenges Faced by Dairy Technocrats

- Understanding the basic quality requirements and ways to maintain hygienic conditions
- Implementing basic value addition
- Knowledge of basic controls/handling of milk processing machines
- Inadequate knowledge of the Food Act, the specifications of product-wise acceptable constituent levels, practical knowledge of conducting tests, recording results, and reporting
- Understanding basic quality requirements and adequate knowledge of maintaining hygiene while cleaning and packaging
- Poor knowledge of operating in a hygienic environment procurement
- Networking skills to maintain good relationship with various stakeholders
- Ability to forecast demand and maintain procurement at appropriate levels
- Understanding of the safety measures during transport from procurement centeres to the plant

** This paper was presented at Session-9. The co-author of this paper is Mr. Raghvendra Sahu, Assistant Professor, College of Dairy Science and Food Technology, Chhattisgarh Kamdhenu Vishwavidyalaya, Raipur, Chhattisgarh*

- Inadequate communication skills, especially in local language because of diverse dialects

Gaps in Dairy Technology Education

- The supply-demand gap is high in the sector.
- All institutes are not equally equipped to impart training and teaching to the dairy graduates.
- Difference in curriculum delivery
- Lack of human resource who can take advantage of the electronic revolution.
- Lack of individuals capable of higher order thinking
- Want of talent in this field

New Initiatives Proposed for Improving the Standards of Higher Education in Dairy Technology

Considering the difficulties faced by the dairy graduates and gaps in dairy technology education, the Indian Council of Agricultural Research, New Delhi has taken up few bold steps for improving the dairy technology education. These improvements are suggested by a team of experts and are known as recommendations of the Fifth Deans Committee. Some of these initiatives are described below.

Course Content Level

The course content of the various courses is revised and various new topics were introduced as per the requirement and need of the industry. The courses have been distributed in a systematic way so as to teach basic courses first followed by principles and finally skill development. Some of the courses like Environmental Studies & Disaster Management, Communication Skills & Personality Development, Information & Communication Technology and Entrepreneurship Development & Business Management are introduced to make the dairy technology graduates more skilled and equipped.

Student READY (Rural and Entrepreneurship Awareness Development Yojana)

To reorient graduates of dairy technology for ensuring and assuring employability and to develop entrepreneurs for emerging knowledge intensive in dairy technology, the component envisages the introduction of the program in all the agricultural universities as an essential prerequisite for the award of degree to ensure hands-on experience and practical training. The following components, which are interactive and are conceptualized for building skills in project development and execution, decision-making, individual and team coordination, approach to problem solving, accounting, quality control, marketing and resolving conflicts, etc. with end to end approach in Student READY program of Dairy Technology are introduced in undergraduate programme.

Development of DPRs for establishment of new colleges

The Deans Committees have been listing some minimum standards/requirements for the colleges. A

Student READY program of Dairy Technology is introduced in undergraduate programme

Component	Duration	Activity
Rural Dairy Work Experience programme	10 weeks (0+10) (total 10 credit hours)	**First year:** On Milk Production & Procurement to be taken up in State Dairy Federations/ Dairy Development Departments/Private Dairies/Animal Husbandry Department/Cattle farm/Progressive dairy farmers **Second Year:** On Preliminary Dairy Operations to be taken up in Experimental Dairy/Referral lab/Dairy Plants
Experiential Learning Module	10 (5+5) credit hours	Development of Detailed Project Report on products like Ice cream, Milk Powders, Cheese, By-products etc. Setting up of enterprise in the selected areas of product manufacture and evaluation of the module
In-plant Training	Six months duration (One semester)	To undergo Exposure to Product manufacturing operations in Dairy & Food Industry

comprehensive Detailed Project Report (DPR) for establishing a college has been prepared which is covering the minimum infrastructure requirements, faculty positions and staff positions. The Deans Committees have been listing some minimum standards/requirements for the colleges. A comprehensive Detailed Project Report (DPR) for establishing a college has been prepared which is covering the minimum infrastructure requirements, faculty positions and staff positions.

Declaring degrees as professional

The Indian Council of Agricultural Research declared all 11 degrees in agricultural sciences as professional, this will help in attracting talent towards Dairy Technology.

Implementation of recommendations

ICAR has taken initiative for implementing theses recommendations mandatory through the National Agricultural Education Accreditation Board (NAEAB).

Conclusion

A comprehensive, vibrant and quality education system in congruence with a dynamic research and technology development setting is fundamental to the natural progress and prosperity. Education with academic excellence and relevance (employability and entrepreneurial ability) is need of the hour for meeting out the demand of the industry. The dairy and food sector is one of the sectors which has tremendous potential for growth and employability. This sector is still facing serious shortage of trained manpower and quality manpower. Considering this very fact various innovative interactions were introduced for dairy and food technology education. The Fifth Deans' Committee of the Indian Council of Agricultural Research reinforcing the congruence of excellence and relevance has judiciously updated the curricula, course content and degree nomenclature. It also suggested reforms in admission, examination, faculty requirement, etc. The committee has also recommended introduction of a very unique programme of Student Rural Entrepreneurship Awareness Development Yojana (READY) which will help in improving the skill and confidence of the graduates.

Imparting Employable Skills for Sustainable Growth of the Dairy Sector*

By
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Introduction

Dairying used to be a subsidiary occupation of the rural masses, but its scope and profile is changing with the importance being ascribed to the sector in doubling farmer's income and production of value-added products. The dairy sector is going to play an important role in the sustainable growth of agriculture and is proving livelihood to the rural community due to new interventions like National Dairy Plan-I, Dairy Processing Infrastructure Development, etc. The availability of trained skilled manpower will be one of the key components in accomplishment of the set objectives and targets. The dairy industry requires skilled and supervisory level human resource and entrepreneurs with sound practical orientation, and the skill sets required are in the areas of dairy farm management, milk procurement, storage and transportation, milk processing and value addition, food safety, etc. to cope up with the enhanced volumes and increasing demand for milk and milk products. The sector requires capacity building comprising development/upgradation of skills and promotion of employable skills. Human resource development in the dairy sector needs a holistic approach for skilling and moving towards entrepreneurship and innovation. The collaboration among the industry, educational institutes and skill councils will set the path for development of competent human resource in a cost-effective manner as skill development is capital intensive in nature.

Employable Skills — Current Scenario

The dairy sector mainly comprises two sub-sectors viz. dairy farming and dairy processing. The different employable skills required in the dairy industry either to get job or becoming entrepreneur are: (a) Dairy farm management including milking management, marketing, etc.; (b) Veterinary services by veterinary doctors and para-veterinary professionals; (c) Allied dairy farm activities related to feed mills, pharmaceuticals industry, distributor of inputs like feed, medicines, etc.; (d) Procurement, storage and distribution of liquid milk; (e) Establishment of dairy farm and dairy plants (dairy engineers); (f) Dairy processing and value addition; (g) Storage, transportation

** This paper was presented at Session-9. The co-author of this paper is Dr. P. Vijayakumar, School of Agriculture, Indira Gandhi National Open University, New Delhi.*

and distribution of milk and milk products; and (h) Research and Development (dairy scientists and dairy technologists).

Shortage of skilled, semi-skilled and unskilled workers has emerged as a critical factor impacting the competitiveness of the Indian food industry (Rais *et al*, 2013). According to a FICCI report, around 58% of the employers are dissatisfied with technical skills and knowledge needed for the job. Also 72% showed discontent with employees' ability to use appropriate and modern tools, equipment, and technologies specific to their jobs (FICCI, 2010). The development of technician level/middle level human resource is one of the weakest linkages in the agriculture education system which is also true for the dairy industry.

By and large, the present education system is more skewed towards development of graduates and post-graduates, and does not address the knowledge and skills requirements of the grassroots level stakeholders, i.e. farmers, skilled and semi-skilled workers (organised and unorganised), small and medium entrepreneurs, and supervisors and technicians.

According to the National Skill Development Corporation (NSDC) report titled "Human Resource and Skill Development in Food Processing Sector (2022)", about 80% of the workforce, with educational background of 10th pass or below, require 'short term/modular' training/skill building of some form or the other. Further, there is paucity of diploma/certificate and short educational/ training programmes for development of skilled workers, and the dairy sector would require about 68,000 trained human resource annually and the demand for 2022 would be about 10 lakhs.

Institutions Involved in Skill Development

Institutions involved in skill development activities in the dairy sector are: (a) Government Organizations/ Departments: Ministry of Skill Development and Entrepreneur (NSDC and Skill Councils), Agriculture Skill Council of India (ASCI) and Food Processing Sector Skill Council - FICSI (Food Industry Capacity and Skill Initiative), Ministry of Agriculture and Farmers Welfare, Ministry of Food Processing Industries, Ministry of Labour (Directorate General of Employment & Training – DGE&T), State Animal Husbandry Departments, State Livestock Development Boards, etc., (b) Conventional Education and Extension Institutions: Central and State Agriculture and Veterinary Universities/Colleges, ICAR Institutions like the National Dairy Research Institution (NDRI), Karnal, Indian Veterinary Research Institution (IVRI, Izatnagar) etc., Krishi Vigyan Kendras (KVKs); (c) Distance Education Institutions: Indira Gandhi National Open University (IGNOU) and few State Open Universities with Agriculture faculty like YCMOU, Nasik, (d) Polytechnics: Under State Agriculture/Veterinary University/Colleges, (e) Corporate Bodies/Organizations: National Dairy Development Board (NDDB), Dairy Federations/Cooperatives/Unions like AMUL, Visaka, Saahaj Dairy etc., Mansinhbhai Institute of Dairy & Food Technology (MIDFT), Mehsana, Multinational Companies like Nestle, DeLaval, (g) Non-Governmental Organizations (NGOs): BAIF, JK Trust, Ayurvet Limited etc.

The School of Agriculture, IGNOU is offering distance learning programmes in the area of dairy development at various levels, i.e. Awareness Programme on Dairy Farming for Farmers, One-year Diploma in Dairy Technology for Developing Technicians and Entrepreneurs, PG Diploma in Food Safety and Quality Management and Ph.D. in Dairy Science and Technology as part of continuing education programme.

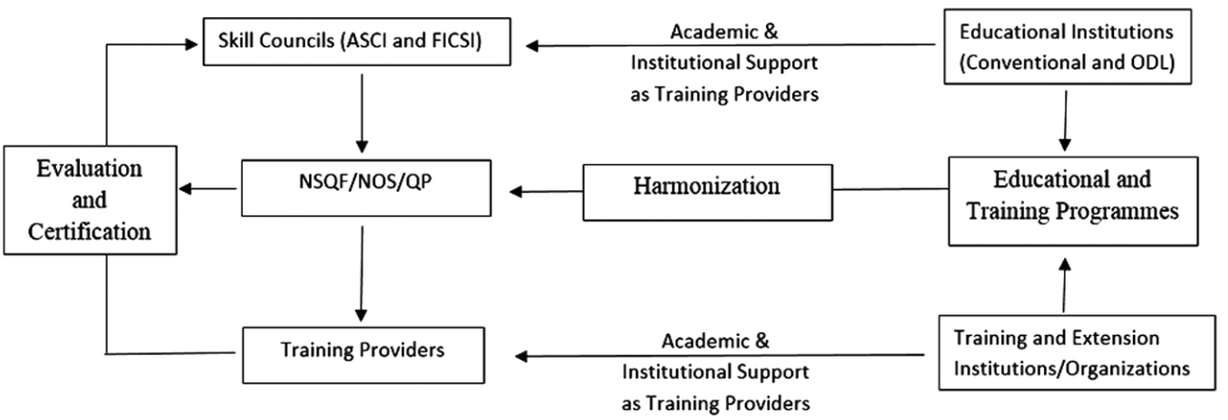
Strengthening Skill Development Activities

- Development of NSQF Compliant Training and Educational Programmes: According to the Government of India notification, it is mandatory for all training/ educational programmes/courses to be NSQF-compliant, and all the other training and educational institutes shall define eligibility criteria for admission to various courses in terms of NSQF levels.

Similarly, the Govt. Departments/State Governments are encouraged to amend their recruitment rules as well as those of State public sector enterprises to define eligibility criteria for all positions in terms of the NSQF level. The acceptability and recognition of the vocational and skill development programmes can come by their harmonization with the NSQF. The qualification framework gives due respect to the experience and informal sector workers also through Recognition of Prior Learning (RPL/APL).

The ODL can be a good enabler because of its inherent characteristics such as open access and open pedagogy to design and implement modular educational programmes with multiple entry and exits. Linking/ harmonization of the already existing ODL programmes with the National Occupational Standards (NOSs) and Qualification Packs (QPs) needs to be encouraged and ensured.

The process of harmonization of educational and training programmes with the NSQF is depicted below:



However, the certification model being practiced by the Skill Councils does not give this opportunity to the passouts of the educational or training institutions which needs to be addressed by the NSDA.

- Collaboration among Institutions and Industry: The skill development programmes are capital intensive and can be run successfully with the support of the industry and through ODL. There is a need to develop a collaborative model wherein IGNOU/ODL develops the need-based programmes in alignment with the NOS/QP and the industry is a partner as the study centre/training provider for delivery. Collaboration between the industry and educational/training institutions can play a key role in capacity building and training activities through PPP modes in generating qualified technicians/upgradation of skills at their doorstep, ensuring productivity and academic culture in the dairy plant. It can lead to a win-win situation for all stakeholders.

- Transformation from Classroom Learning to Virtual Learning: Digitalization is transforming the existing framework of Open and Distance Learning (ODL) to ODeL (Open and Digital e-Learning). The SWAYAM and SWAYAM PRABHA are the online platform and DTH platform for Life Long Learning. NDRI has developed an e-course on Dairy Technology and TANUVAS has developed an e-course for the UG Veterinary Students under the NAIP Project of the ICAR. IGNOU is also developing and offering various MOOC programmes in the area of Dairy Technology through the SWAYAM Platform. Effective utilization of e-learning platforms and Open Educational Resources (OER) can help in improving the access to education, cutting costs and improving quality.

- Setting Up of Dairy Education and Skill Development Council: Keeping in view the scope and gigantic nature of the dairy sector, there is an urgent need to set up a Dairy Education and Skill Development Council which will help in developing the requisite manpower requirement in large scale in a short period of time to meet the demand-supply gap which is widening day by day. Moreover, such sector-specific Skill Council will also help in effective implementation and monitoring of skill development activities and also help in maintaining the standards of skills and competencies imparted.

Conclusion

It is envisaged that the establishment of a Dairy Education and Skill Development Council may help in qualitative and holistic growth of human resource for dairy sector. The skill development programmes should be aligned with the NOS and QP of NSDC (Skill Councils). Formal educational institutions — schools/colleges/universities be approved as recognised training providers and the students be assessed for corresponding NOS/QP. ODL interventions would generate a critical mass of human resource at various levels which would act as catalyst for inducing food safety and productivity in the sector. The industry can play an important role as development and delivery partner of ODL programmes for mutual benefit of each other.

References

The author may be contacted through email for references.

Technical Session : 10

Milk Production - Animal Health and Sustainability

Chairman:
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Rapporteur:
Dr. Yancy Mary Issac

Speakers:
Dr. R.C. Upadhyay, Dr. K. VinodKumar and Dr. S.K. Rana

Sustainable Dairy Development under Climate Change — Challenges and Opportunities*

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Introduction

The Indian livestock production system is predominantly a mixed crop-livestock farming system, with the livestock segment supplementing farm incomes by providing employment, draught animals and manure. The livestock sector plays an important role in the Indian economy and provides livelihood to two-thirds of rural community. Livestock contributed 16% to the income of small farm households as against an average of 14% for all rural households. Livestock also provides employment to about 8.8 % of the population in India. India has more than 512 million livestock and the livestock sector contributes 4.11% to national GDP and 25.6% of total agriculture GDP. India ranks first in milk production, accounting for 18.5 per cent of the world production, achieving an annual output of 146.3 million tons during 2014-15 as compared to 137.69 million tons during 2013-14 (DAHD, MoA, GOI).

Rise in milk production in India during past years and anticipated growth for the next two decades or so is not likely to match either biological potential or biophysical potential of adapted livestock species and breeds (Zebu or Zebu X taurine breed of cattle or buffaloes) in the wake of climate change and threats to livestock. The production potentials of indigenous livestock remain to be understood through the systemic scientific attempts. Different aspects of the animal production system (e.g. prenatal and post-natal growth to attain early puberty) have not been targeted for exploiting biological potential. Availability of dry and green quality feeds and fodders to more than 512 millions heads of animals is not only a challenge for optimizing productivity but also necessary for improvement in livestock efficiency. Most animals barely meet their minimum maintenance requirements. The quality of concentrate mixtures available neither fulfils the requirements nor provides nutrients commensurate to the production. Therefore, sustainable livestock production under different farming systems without scientific management or standard management system is a challenge for future livestock development in India.

Animal management and health care practices not only need to be improved in future but also require strengthening for full genetic expression and potential

* *This paper was presented at Session-10.*

improvement. Animal immune deficiency diseases like mastitis, metritis, reproductive problems, hoof diseases and other parasitic and protozoan diseases will require proper management and health care for their control/ reduction. Use of antibiotics for the treatment of these ailments and diseases in livestock population should be discouraged by policy to prevent their entry in human food chain. A proper policy and/or implementation agency is therefore needed to tackle the issues related to food and drug administration in agriculture production system. A lot therefore needs to be done and strategically planned for sustainable livestock development and efficiency improvement.

The livestock sector is both a sufferer and a cause of climate change. The impacts of climate change on animal husbandry & dairying are likely to be both direct and indirect. Climate change will not only affect livestock production functions negatively but also livestock health will be adversely affected. Increased thermal discomfort magnitude and duration will impact animal production functions and animal diseases emergence/re-emergence scenario. Since animal husbandry & dairying form a major component of livelihoods and contribute to food and nutritional security, it can play a pivotal role in achieving Sustainable Development Goals (SDGs) of poverty alleviation, food security, sanitation etc. Therefore, an integrated animal husbandry & dairying development strategic plan is needed to ensure food and nutritional security of 1.25 billion humans without compromising environment and sustainable development goals.

Livestock Production and Sustainable Development Goals (SDGs)

Dairy production, milk processing and value chain issues related to livestock in particular are critical for food and nutritional security and ending poverty. An increased use of clean energy in place of cow dung/fuel wood will reduce the risk posed to women and girls by bio-pathogens and zoonotic microorganisms. A change in practice of manure and farm waste use for energy and easy access to affordable, reliable, modern energy (liquid petroleum gas/electric power) for use by women and girls in rural and urban areas will help improve hygiene and sanitation and help ensure healthy lives and promote well-being for all. Further, this will help in achieving gender equality and empower women and girls.

In this context, the progress on ending poverty cannot be achieved without progress on food security. Entrepreneurship in animal husbandry and dairying, livestock production, product design, milk and ethnic milk and milk products will not only provide full and productive employment and decent work to rural youth and women but also reduce inequality and help enhance resilience to climate change. Therefore, improved, green and scientific livestock and dairy production and its success in rural India will lead to better human health and wellbeing, thus contributing to sustainable development goals.

The Indian livestock production system requires concerted efforts and policy planning for sustainable development. Therefore, not only the animal genetic resource pool needs to be upgraded and evaluated for its utility in the present context but it also requires scientific interventions and management tools for efficiency improvement. The production efficiency improvement of the existing livestock is possible through proper selection breeding and upgradation for higher production. Scientific and assisted reproduction techniques may be suitably applied to reduce time lag and long progeny gaps. Livestock management tools akin to farming conditions based on local needs and feeds & fodder resources may help improve animal productivity and efficiency. India at present neither has a clear vision nor policy for livestock production system improvement and health care. Thus the livestock sector is neglected both at the State and Central levels. Livestock production therefore needs to be technology-driven in future with emphasis on enhanced production efficiency.

Strategic Planning and Legislation: Challenges and Opportunities

The contribution of livestock to Indian economy is about 4% of GDP from 512 million heads with an investment of only about 1%. Over the years, little emphasis has been put on improving the animal husbandry and dairying system in India. Programmes, plans, policies, legislations are inadequate and do not cover all segments of livestock, their health and welfare in different agro-climatic conditions. The existing policies neither favour rural population development & progress nor support livestock development. The programmes for livestock development keep changing shape, objectives due to lack of vision, strategies and goals. Low financial outlays remain unutilized or undisbursed indicating poor execution or apathy of the implementing authorities and/or administration.

Milk production of more than 146 million tones is contributed by cattle, buffalo and goat and more than 10 million tons of meat is contributed by goat, sheep and buffalo. The existing animal husbandry practices are primarily based mainly on indigenous traditional knowledge and practices with high compounded efficiency of animal energy and milk production from multi-utility cattle or buffalo. This model based on multi-utility of animals with limited inputs with little manpower requirement at small and marginal farms systems was sustainable in different agro-ecological zones. The shift in emphasis for single utility, e.g. milk or meat, has made multi-utility animals/species redundant. Efforts to improve indigenous animals for single utility (milk or meat) have failed or given limited output and more challenges. Therefore, an efficient animal husbandry and dairying model based on sustainable genotype under climate change needs to be nurtured to cater to the needs of marginal and small farming systems.

Huge existing genetic resource and animal husbandry & dairying infrastructure need to be judiciously utilized for enhancing efficiency and bring improvement. Animal reproduction and breeding techniques for genetic improvement and enhancing efficiency of production should be suitably addressed. More funds should be allocated for animal health and welfare infrastructure development and human resource development for huge livestock wealth spread in different agro-climatic conditions. Animal health care, disease monitoring, surveillance, prevention, control, etc. require state-of-the-art infrastructure development at State and Central levels to make livestock free from communicable and zoonotic high-risk diseases.

A large gap in demand and supply of products is the genesis of malpractices to enhance supply of milk and milk products. The supply chain system is totally ineffective in the absence of effective legislation and enforcement at different levels. Inadequate punishment (quantum and magnitude), provision to punish offenders, easy or unchecked movement of raw and value added products, poor quality raw material, political nexus of offenders, long pendency of cases, etc. are some of the causes that help offenders escape law. Therefore, a stringent law on supply chain enforcing quality control on livestock products (meat, milk and products), adulteration and its enforcement at different levels is an urgent requirement in India.

The pace of milk production governed by forces other than the potential of production in cows and buffaloes are matter of concern for people and policy development mainly due to quality animal products. The problems associated with post-production, processing and value addition not only indicate unchecked transporting (meat, milk and products) but also permit unethical trading. This is also a reflection on the inadequate State or Central regulatory authority and/or their silence on the issues of public concern. Both State and Central government organizations/agencies do not seem to be concerned at the legalized transport of milk (homogenized, adulterated, synthetic, diluted, etc.) without a check and interruption to processing units and/or dairy plants eager to handle for meeting targets of milk processing without any emphasis on quality. Unethical trade practices also flourish in connivance with shopkeepers and suppliers of milk products (Khoa, Paneer, Ghee etc). The growth of the dairy sector, in the absence of defined ethical code of practices and concerns for human health or environment, has been fuelled by the nexus of government and/or non-government agencies, private agencies and mafias that control the animal husbandry and dairying sector, dairy industry, livestock feed manufacture and the value chain of the Indian dairying system. This needs to be fixed by refining laws, policy development and enforcement of laws on food adulteration throughout the country at the earliest.

Further, a regulatory framework needs to be in place to support and implement climate change coping and adaptation policies on animal husbandry and dairying. An integrated livestock development programme with agriculture across the spectrum of natural resources needs to be developed. This needs to be suitably aligned with SDGs for food, hunger, energy, etc. Legislative guidelines on the meat, milk and products involving different stakeholders, likely to be affected by climate change, need to be suitably formulated for coping and adaptation. The SDGs the right to food (quality and quantity) may serve as a tool to mitigate potential trade-offs between different adaptation requirements (e.g. climate coping strategies and food security needs).

The sector offers immense possibility for employment generation and key opportunities exists in sustainable breeds and breeding, feed and fodder resources management, livestock and livestock waste management, disease surveillance, monitoring, disease prevention and

vaccination programmes, scientific livestock development etc.

Summary

The Indian livestock production system is predominantly a mixed crop-livestock farming system, with the livestock segment supplementing farm incomes by providing employment, draught power and manure. The livestock sector plays an important role in the Indian economy and provides livelihood to two-thirds of rural community. Livestock contributes about 16% to the income of small farm households as against an average of 14% for all rural households. Livestock also provides employment to about 8.8 % of the population in India.

Rise in milk production during past years and anticipated growth for the next two decades or so is not likely to match either biological potential or biophysical potential of adapted livestock species and breeds. Therefore, livestock production under different farming systems under climate change scenarios without scientific interventions and management tools will not be possible or sustainable. Animal management and health care practices not only require improvement but also need strengthening for full genetic expression and improvement. Animal diseases (viral, bacterial, parasitic and protozoan diseases) will need proper management and health care. India at present neither has a clear vision nor policy for livestock production system improvement and health care. A proper policy and/or implementation agency is therefore needed to tackle the issues related to food and drug administration in agriculture production system. Different steps on milk production, processing and value chain need to be properly addressed keeping in view the impact of climate change on production and value chain.

Therefore, sound strategies, implementable policies and regulatory mechanisms in animal husbandry and dairying will not only generate employment opportunities but also help cope with climate change challenges in future.

Technical Session : 11

Economics and Social Issues

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Dr. Athira S.

Speakers:
Dr. Letha Devi G., Dr. M.C.A. Devi and Dr. Geetakutty P.S.

Dairying and Rural Development: Challenges and Prospects*

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Introduction

The ndian dairy industry has transformed the life of rural people. Dairy products are a major source of nutrition for millions of people and the only acceptable source of animal protein for the large vegetarian population. Dairying is one of activities aimed at alleviating poverty and unemployment in rural areas. Small and marginal farmers account for three-quarters of households owning livestock, raising about 56% of bovine and 66% of sheep population. The dairy sector provides regular employment to more than 9 million people annually and more than 75% of this are women. Progress in this sector will result in more balanced development of the rural economy.

India is the largest producer as well as consumer of milk in the world. We contribute about 18% to the global milk output. Approximately 70 million rural households engaged in dairying account for about 95% of the total milk production. A network of about 198 dairy cooperative milk unions covering about 15.46 million farmers under the ambit of 1,65,835 dairy cooperative societies operate in the country. About half of the milk produced is retained for household consumption and only 30 to 35 per cent is delivered to formal milk processors. During 2015-16 the growth in milk production in India has been 6.7%. The average growth in milk production in India is 4.2%, whereas the world average is 2.2%. Productivity per crossbred cow is 7.15 litre per day, whereas that of buffalo is 5.15 litre per day, which are much lower than the global productivity. Looking into the scenario of average farm household income, livestock contributes 12% to the rural household income. But in recent years, maximum growth, i.e. 14% in rural income, has been from the livestock sector.

Major forces countervailing dairy development

There are a few forces that countervail dairy development of the country. Some of them are:

- Inadequate availability and cost of quality feed and fodder
- Decline in common grazing lands

* *This paper was presented at Session -11. The co-authors of this paper are Dr. M.A. Kataktalware, ICAR-NDRI, SRS, Bengaluru and Dr. Niketa L., ICAR-NDRI, SRS, Bengaluru*

- Deficient animal health services/focus on the curative approach to livestock health services
- Breeding services to livestock not up to the desired level
- Climate variability and uncertainties
- Non-availability of indigenous milk purpose breeds
- Low productivity of animals

Key Areas of Concern in Dairy Sector

The key areas that have to be focused for comprehensive development of this sector are:

- Competitiveness, cost of production, productivity of animals
- Production, processing, value addition and marketing infrastructure
- Trade: Import of value-added products and export of lower value products
- Domestic consumption

SWOT Analysis of Indian Dairy Sector

An attempt is made to carry out SWOT analysis of the dairy sector and the strengths, weaknesses, opportunities and threats are listed below:

Strengths

- Increasing demand for milk and milk products
- Growing organized milk processing and flexibility of product mix
- Availability of trained & qualified technical manpower
- Potential to increase milk yields
- Diverse bovine population
- Margins
- Availability of raw materials

Weaknesses

- Diminishing and fragmented land resources
- Lack of awareness about scientific management, quality milk production, and value addition
- Perennial deficit of green and dry fodder, increasing cost of quality concentrates
- Poorly maintained roads, erratic power supply, and inadequate transportation facility that make milk procurement difficult
- High costs for cold storage and transportation of milk
- Poor access to institutional credit
- Perishability of produce

Opportunities

- Ever increasing population growing at more than double the rate of milk production
- Enabling government policies, strong network of cooperatives
- Increasing demand for convenient and quality milk products
- Availability of advance animal production technologies for increasing production, improving productive and reproductive efficiency, diagnosis, and control of animal diseases
- Application of information technology and management tools to improve profit margins substantially
- Possibilities of value addition
- Export potential of products

Threats

- Low productivity and scattered production leading to high cost of transportation
- Degraded community grazing grounds, rapidly losing carrying capacity
- Climate change
- Significant increase in cost of inputs
- Adulteration/quality concerns
- Milk vendors, the unorganized sector

The 'strengths' and 'opportunities' of the dairy sector far outweigh 'weaknesses' and 'threats'. Strengths and opportunities are fundamental and weaknesses and threats are transitory. We have to focus on utilizing our strengths and opportunities to attract more entrepreneurs into dairying and enhance production and productivity. At the same time, we need to work on evolving strategies to combat weaknesses and threats so that dairying becomes more sustainable.

Possible ways to enhance dairy farmer's income

A few measures that can help in enhancing the farm income are listed below:

- Increase in milk price and pass on the benefits to milk producer members
- Improving milk production by increasing milch animals
- Improving the productivity of animals
- Reducing the cost of milk production
- Technology interventions

Interventions: Animal Breeding

- Increasing AI coverage to 100% (nos. of villages/animals)
- Quality control of semen banks/stations
- Introduction of superior bulls for breeding
- Establishment of bull mother farms

- Promotion of mobile AI service at the doorsteps of farmers
- Availability of low-cost AI equipment and liquid nitrogen
- Use of modern technologies like semen sexing, IVF, ETT etc.
- Strategy for conservation of indigenous breeds
- Formation of AI worker training centres
- Certificate course for AI workers and regulations of area of work

Interventions:Animal Productivity Enhancement

- Registration of all animals covered under AI
- Upgrading and improving productivity of state-specific cattle and buffalo breeds
- Elite/superior animal identification and registration
- Milk recording of elite/superior animals for bull mother farm
- Genetic upgradation of non-descript animal breeds
- Calf rearing programme for calves of superior animals

Interventions: Animal Health

- Mass vaccination and de-worming programme
- Strengthening of disease diagnostic laboratories
- Quarantine station to be established, particularly at the interstate border
- Need to train village resource persons for first aid services

Interventions: Animal Feeding

- Community fodder farm/fodder bank at village level
- Introduction of new high yielding fodder varieties
- Indigenous technologies to convert low-value roughages into high nutritive value
- Incentive to farmers to grow fodder instead of cash crops
- Ensuring feed and fodder availability through waste land by village dairy cooperatives on lease for longer period
- Availability of cattle feed and mineral mixture by installing cattle feed and mineral mixture plant in each milk shed area

Interventions: Education/Training/Extension

- Implementation of cleanliness module (cleanliness at all levels campaign)
- Training of milk producers through various programmes like Entrepreneurship Development Programme (EDP), Commercial Dairy Farming (CDF) etc.
- Establishment of facility and certificate course for training of farmers for Commercial Dairy Farming (CDF)
- Milk producer members to be targeted as entrepreneurs and given training based on latest scientific animal husbandry practices.

Conclusion

Without increasing productivity, efficiency and competitiveness, survivability is difficult in the age of globalization. Key areas of concern are competitiveness, cost of production, productivity of animals, infrastructure, value-addition etc. Some specific initiatives may be taken to meet the challenges of enhancing production and farm income. Cooperatives and NGOs must proactively identify potential rural entrepreneurs and promote dairying. Besides, we need to attract large rural youth population for sustained and focused efforts. For ensuring linkages, dairy development agencies have to tap into programmes like NRLM and NDP. Strengthening and revival of existing dairy cooperatives in terms of their institutional, technological and professional capacities is very essential. Cooperatives for milk procurement and marketing should continue, there is also need to promote collectives for fodder production, livestock rearing and production.

Recommendations

- Policy support to attract youth and promote dairy entrepreneurship
- Provide efficient yet economical procurement network, attractive procurement price for farmers
- Low-cost alternate, yet quality feed
- Promote innovations (in production, product lines and marketing) and convert products into commercially exploitable ideas/value addition
- Focus on quality in milk production and product lines.

Technical Session : 12

Newer Issues for Next Generation Dairying

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by
IDMC

Commercial Presentation : 2 and Nutritional Presentation

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***Presentation* by:**
Mr. I.K. Narang, Reps. of M/s SSP Pvt. Ltd. and M/s Duke Thomsons India Pvt. Ltd.

Modern Science Validates our Scriptures on Nutritive Value of Milk*

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Milk has been recognized as a complete food by nutritionists all over the world. It has all the ingredients and nutrients necessary for the growth and maintenance of a healthy human body. Modern science as well ancient Indian texts and scriptures are full of references eulogizing the virtues of milk as a complete food. Indian scriptures have even described milk as the elixir of life or *Amrita*. A *shloka* in Mahabharata (65-46) states as under:

अमृतं वै गवां क्षीरमित्याह त्रिदशाधिपः ।
तस्माद् ददाति यो धेनुममृतं स प्रयच्छति।

महा० अनु० ६५/४६

"Amritam Vai gvam khriramityah tridshadhip,
tasmad dadatim yo dhenumamatrim sa Praychhti".
(Mahabharata Anu. 65-46)

The *shloka* means 'Cow milk is Amrita. Therefore, if someone donates a cow, he actually donates the Amrita'.

Similar reference has been found in the Rig-Veda (Rig. 1-71-9) - '*Goshu priyamamrutam rakshmana*' which means 'Cow milk is Amrita..' It protects us (from disease). Hence, protect the cow.

The Rig-Veda in another mantra (5-19-4) describes cow milk as the most desirable and likeable drink. There are several similar descriptions in other scriptures, which enumerate the health-providing, prophylactic and curative properties of milk. Milk has been described as a drink providing vitality, immunity (the inner strength to fight diseases), a complete balanced diet, which gives 'Subudhi' or the right thinking power or wisdom.

What is to be considered here is whether cow milk has been compared with or described as Amrita only on sentimental/emotional or religious grounds, or whether there is any description of certain specific qualities or properties of milk and milk products which help cure certain ailments or enhance the longevity or vitality of life to the extent of making the regular consumer of milk a healthy person with a long life. This paper attempts to have a look at various scriptures and other relevant books to find out the truth, to find out why milk has been compared with Amrita.

Charak Shastra

Charak Shastra is one of the most ancient books in the history of medical science. Rishi Charka was an eminent Indian physician and his book *Charak Shastra* is followed even today by the practitioners of the Indian system of medicine - the 'Ayurveda'. *Charak* has described milk as:

स्वादुशीतं मृदु स्निग्धं श्लक्ष्णपिच्छिलम्।
गुरू मन्दं प्रसन्नं च गव्यं दशगुणं पयः॥ 216॥

चरक सूत्र स्थान २७/२१४

* *This Nutritional Presentation was made by Mr. Narang at Commercial Presentation-2. Mr Narang has written this paper on the nutritive value of cow milk as understood by ancient Indians and as propounded by the Vedas and other scriptures. A dairy technologist, he has also done Master's degree in Vedic Literature from Gurukul Kangari University, Haridwar.*

"Swadu, shitam, mridu, snigdham, shalakshanpichhlam;
Guru, mand, prasanna cha gavyam dashaguna paya"
(Charka sutradhan 27-214)

This *shloka* describes the organoleptic and nutritional properties of milk. It says cow's milk is tasteful, sweet, has a fine/subtle flavour, is dense, and contains good fat but light, easily digestible, and not easily spoiled. It gives us tranquillity and cheerfulness. In the next *shloka*, *Charka* says that because of the above properties, cow's milk helps us build up vitality and virility.

Again at *Charka sutradhan* 27-214), it is stated that '*kshiryojaskar pusam*' which means milk increases vitality and virility in man.

Dhanvantri, another ancient Indian physician, has stated that cow's milk is a desirable and preferred diet in all types of ailments. Not only that, its regular use protects the human body from Vata, Pitta and heart diseases. *Raj Nighantu*, another authoritative treatise on Ayurveda also describes milk as Amrita or Piyush. Even modern science tells us that milk helps in curing uric acid problems and acidity conditions in stomach. The protein in milk has a lot of buffering effect. Drinking milk is, therefore, advised in case of hyper acidity or peptic ulcer formation. The buffer in protein provides relief to a great extent.

References in the Vedas

The properties of milk as the provider of vitality and strength are stated in the following mantra (4-21-6) of the Atharva Veda.

"यूयं गावो मेदयथाम कृशं चिद्श्रीरं चित कृणुथाम सुप्रतीकम
भद्र गृहम कृणुथ भद्रवाचो बृहद वो उच्यते सुभासु"

अथर्व ४/२१६

"Yuyam gavo medyatham krishm chiskhyreeram, chit krinutha supratikam, Bhadra Griham Krinuth, bhadravapo beihad vo vya uchachate, sabhasu."
(Atharva Veda 4/21/6)

The mantra means, - 'The cow, through its milk, transforms a weak and sick person into an energetic person, provides vitality to those without it and by doing so makes the family prosperous and respectable in the civilized society'.

Obviously, a family of sick and weak members can neither be prosperous not respectable in the civilized society. This mantra incidentally brings out a social dictum that good health in a family was taken as an indicator of prosperity and respect in the Vedic society. Material wealth alone was not the parameter of respectability as is the case today. Availability of plenty of cow milk in a household was taken as an indicator of prosperity and status.

Another mantra from the Atharva Veda states:

"धेनवः धानाः ऊर्जम अस्मे विश्वाहा दुहाना तन्तु"

-- अथर्व १८/४/३४

'Dhenav dhana urajam assame vishwaha duhana tantu'
(Atharva Veda 18/4/34)

This means high yielding cows may continue to provide you with milk full of energy and nutrition.

The Atharva Veda's mantra 18-4-16 and 18-4-19 refer to the tradition of greeting and welcoming the learned sadhus (saints), and guests (atithies/learned visitors) by offering milk and milk products. A type of bhat made with milk, rice and ghee was a very common recipe for this. This was probably a version of kheer made with rice and milk these days in most parts of India. It is because of these nutritive and vitalizing properties of cow milk that in the Atharva Veda (18-4-34) we pray for high yielding cows as stated above.

Preventive and curative qualities of cow milk

The preventive and curative qualities of milk are also described in the Atharva Veda.

अनु सूर्यमुदयतां हृदयोतो हरिमा च ते
गो रोहितस्य वर्णेन तेन त्वा परिदध्मसि।

(अथर्व १।२२।१)

"Anu suryamudyataam hridyoto harima cha te go rohitasya varnen ten twa paridadmasi".
(Atharva Veda 1/22/1)

The above mantra tells us about the curative value of cow milk in heart diseases and jaundice-like diseases (*hriday rog* and *pandu rog*). As per the ancient Ayurveda system, *pandu rog* is an ailment wherein skin gets yellow due to acute and terminal malfunctioning of liver, ultimately leading to death of the patient. Today we know yellow skin and yellow urine are the outward symptoms of hepatitis, which is caused by the malfunctioning of liver due to viral or other secondary infections. It was considered an incurable disease, and milk of red coloured cows was considered to be the only remedy for this. Even today, certain diseases are cured by feeding the patient with milk or buttermilk (*chhachh*). The method is known as *Dugdha Kalpa* or *Chhachh Kalpa*, respectively. This gives us a lead to further investigate and validate this mantra

through modern methods of diagnostic medicine.

Possibility of production of medicated therapeutic milk

The following ninth mantra, 73rd *Sukta*, of the 10th Chapter of the Rig Veda (10-73-9) points to a very important issue. It says, 'Cow provides in its milk the curative and prophylactic effects of the medicinal herbs it eats.'

चक्रं यदस्याप्स्वा निषत्तमुतो तदस्मै मध्विच्चछद्यात
ओषधीषु गोष्वदधा पयो यदूधः पर्थिव्यामतिषितं
(ऋग्वेद 10.73.9)

Similarly, the following mantra of the Atharva Veda also says similar things:

यावतीनामोषधीनां गावःप्राश्नन्त्यघ्न्या यावतीनामजावय तावतीस्तुभ्योषधी :शर्म यच्छन्त्या शर्म यच्छन्त्याभृता
(अथर्ववेद 8/7/25)

Those medicines/herbs that cows eat, and those that goats and sheep eat, those medicines secreted (in milk) may bless you with good health.

Thus, cows, goats and sheep are fed with specific medicines and herbs for the secretion of those medicines to be made available for human health and welfare.

Thus, our ancestors knew the impact of feed on the quality of milk, and that the residues of herbs in feed are secreted in milk. The possibility of production of medicated milk is thus implied. Today we know the residues of pesticides and other undesirable substances like antibiotics, growth hormones and heavy metals are passed on to milk through the feed and fodder given to milch animals. There is, therefore, a distinct possibility of producing medicated/prophylactic milk by feeding cows with herbal substances to produce different types of medicated milks for prevention and cure of different diseases. This is another area of research which we need to explore.

This represents a frontier of Ayurvedic research. This becomes a very significant subject for treating children and older persons.

Importance of curd in Vedas

Like milk, the curd (*dahi*) made out of cow's milk has been described as a likeable food not only for the humans but for gods as well. The following mantra of the Rig-Veda (10-179-3) aptly describes *dahi* (curd):

श्रातं मन्य उध निश्रातमगनौ सुश्रातं मन्ये तदयते नवीयः ।
माध्येन्दिनरय सवनरय दध्न पिबेन्द्र वजिन्पुरुकृज्जुषाणः ।।
(ऋग्वेद १०।१७९।३)

Shratam manya oodh nishrat magnow sushraatam
manye tadyate naviyah.
Madhyen dinasaya sevanasya dadhana pivender
vajrinpuru krijjushanah.
(Rig-Veda 10/179/3)

The mantra means, Milk has first been "cooked" or preserved in the udder of the cow and thereafter, it has been cooked or processed on fire. It has, therefore, been properly/adequately preserved/processed. *Dahi* (curd) made out of this milk is really healthy, fresh and nutritious. A person doing hard work/physical labour should consume this *dahi* during mid-day when the sun is shining".

This mantra indicates at least four important things. It says milk has been "cooked" or preserved in the udder of the cow and, therefore, curd is healthy and fresh. (i) "Cooked or preserved in the udder" is an indicator of natural preserving qualities of milk. We know fresh milk drawn from the udder of a healthy cow does not get spoiled for the first 2-3 hours due to the presence of natural enzymes. (ii) The second aspect is that "cooking" or preservation of milk in udder is indicative of production or secretion of milk from a healthy udder, free from diseases. We now know that milk from a sick cow/udder produced under unhygienic conditions would be having a large number of undesirable bacteria and cannot give good quality curd. (iii) The mantra further tells as that milk was heated or cooked on fire before making curd even in those days. The microbiology and chemistry of milk and curd was, thus, not unknown to the Vedic society/civilization/our ancestors. (iv) This mantra refers to the best time of consumption of curd to be during mid-day when the sunshine is at its peak.

Importance of ghee

The Vedas describe ghee (melted-dehydrated butter or butter oil) not only as an ingredient essential for performing "*Yajna or Havan*" but also as the first and the most essential among all foods. According to Charka (Charka 13/14), ghee is considered as promoter of memory, intelligence, power of digestion and metabolism, semen, vital essence, etc. At several other places in the Vedas, ghee has been described as a (flawless) *Nirdosh* food, which increases body vigour and vitality (Rig-Veda - 10-19-7). The use of *ghee* strengthens the body and helps enhance the life span (Atharva Veda -2-13-1). The Atharva Veda states that *ghee* obtained from cow

milk is one of the best foods in the world.

When mixed with other medicines, it carries properties of the drugs without losing its own inherent properties. Today also, the practitioners of the Ayurvedic system of medicine prescribe several types of medicated ghee preparations for treatment of various ailments. Some examples are: *Piplyadi Ghrit* and *Vasadi Ghrit* for treatment of chronic fever, *Shatavaryadi Ghrit* for bleeding disorders, *Kalyanka Ghrit* for mental disorders, and *Baladi Ghrit* for neurological conditions.

There are, therefore, prayers in the Rig-Veda (10-18-2) and the Atharva Veda (3-12-1 and 3-12-4) seeking that God may provide us with so much of ghee that our houses are always full of this most nutritious food. The 8th mantra of the 12th *Kand* of the third chapter of the Atharva Veda (3-12-8) emphasizes the importance and value of ghee by referring to the "stream of ghee-full of elixir":

घृतस्य धाराममृतेन संभृताम
(अथर्ववेद ३।१२।८)

Ghritasya dharamariten sambhritam
(Atharva Veda 3/12/8)

Karambh – A milk product

The tenth mantra of the 187th *Sukta* of the 1st chapter of the Rig-Veda (1-187-10) mentions of a product named "Karambh"– a combination of *dahi*, *ghee* and *sattu* (malt)– as having medicinal, prophylactic and nutritional properties. The curd and ghee obviously come from cow milk.

Cow – A *Sabardudha*

In mantra 1-20-3 and 3-55-16 in the Rig-Veda, cow has been called *Sabardudha*.

सर्बदुधा
ऋग्वेद- १।२०।३ तथा ३।५५।१६

Prominent interpreters of the Vedas Griphiths, Skandswami and Venkatamadhava have interpreted *Sabardudha* as the provider of Amrita. Others have interpreted this as the provider of all wealth. Both the interpretations aptly describe the importance of cow in Vedic society.

Kakudman Bull

This discussion reminds us of the coin bearing the figure of Vrishabh, the vehicle of lord Shiva, and the "*Kakudman*" bull found from the remains of Mohenjo-Daro. The latter now forms the insignia of the National Dairy Development Board (NDDB), an institution of national importance. Similarly, *Vrishabh*, the vehicle of lord Shiva, is a commonly known figure in various scriptures. The bull symbolizes the cow and its progeny and desire and expectations of the millions of our dairy farmers to take India into its glorious past having thousands of *Dugdha Dharas* – streams of milk, to transform the country again to a land of *Kamdhenus*, providing Amrita, the elixir of life, to bring health, wealth and prosperity to our country.

It is because of these qualities of cow's milk that cow has been treated as "Cow Mother", a provider of Amrita, provider of health, wealth, prosperity, fame and respect. This also made the cow an object of worship and reverence. While praying for freedom and prosperity of nation, the Aryans prayed for high yielding milk cows as well (*Dagdhri Dhenu*, *Dudharu* cows) in *Yajurveda* (*Mantra* 22-22).

Our ancestors were dairy scientists

This analysis is a pointer to the belief that our *Rishies* were dairy scientists. They understood:

- The nutritive value of milk and milk products
- The curative properties of milk, curd, ghee and their combinations
- Secretion of residues of feed ingredients in milk
- The impact of feeding cows on useful herbs to get medicated milk
- The need to heat-treat milk to make it safe and to preserve for longer time

Need for further research

This discussion provides a lead to further investigate and validate the claims like producing medicated milks and research into the medicinal effects of milk drawn from cows of different colours through modern methods of diagnostic medicine.

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Welcome Address

By
Mr. C.P. Charles
Chairman, IDA (SZ)

Good afternoon! Namskar!

It's a great pleasure to see you all in the valedictory function of the 46th Dairy Industry Conference. My hearty welcome to all in this function. I firmly believe that the 46th Dairy Industry Conference has addressed the following major aspects of our continuing journey towards efficiency:

- From the current productivity level of milch animals to the best our country could afford, protecting the interests of small and marginal milk producers through improved breeding, feeding and management practices.
- From the current village-level infrastructure facilities to the enhanced physical and organized milk handling facilities with appropriate cold chain to salvage even the last drop of milk being produced for the benefit of the nation.
- From the current support structures to the more relevant ones that would improve the economy of milk producers.
- From the current cost of milk processing to the optimum level that would be most conducive for a favourable outcome through automation and improvement in structures and processes.
- From the current value addition to value enhancement of milk and milk products for making them better marketable so that the fair share of the consumer rupee is passed down to milk producers to improve their economy.
- From the current quality of milk and milk products to the best of the international standards through improved clean milk production, procurement, handling, processing and distribution practices.
- From the current extension education methodology to ICT-supported ones to disseminate the knowledge to the dairy fraternity across the country for keeping them abreast of their changing scenario.

Efficiency improves the levels in terms of quantity and quality and at the same time regulating the different costs of operations and the effective usage of manpower. I hope the 46th Dairy Industry Conference has been meaningful to the participants and the recommendations of the conference would be implemental.

As the Chairman of the 46th Dairy Industry Conference and the Indian Dairy Association South Zone, I believe that you have enjoyed your stay in God's Own Country, Kerala. We have made efforts to the best of our ability to make the conference useful to the dairy fraternity and make your participation comfortable. If there were any shortcomings, I sincerely regret their occurrence. I hope all of you would be carrying a memorable experience

with you when you leave this place. Let it linger in your mind for years to come.

With these words, I welcome the respected President, Dr. G.S. Rajorhia to the valedictory function and request him to preside over the session.

I welcome the Chairman of the Kerala Cooperative Milk Marketing Federation popularly known as Milma, the brand of Kerala, Mr. P.T. Gopalakurup, the recipient of the most prestigious Dr. Verghese Kurien Award.

I welcome the Managing Director of the Tamil Nadu Cooperative Milk Producers Federation and the Milk Commissioner, Dairy Development Department, Government of Tamil Nadu, Mr. C. Kamaraj, IAS. He has kindly agreed to address the participants at this function at a short notice. I would like to mention here that he has taken over as the managing director of the Tamil Nadu Federation about six months back. I was just observing the progress of the Federation and the unions under his able leadership. I was told and I also see that the milk sale in Tamil Nadu both in Chennai and in the hinterland has increased by about 10% for the last six months. I think we should congratulate him for his untiring work.

I welcome Professor Dr. Geevarghese, Secretary General of the 46th DIC. Without whom and his team's untiring work for the past one year, this conference would not have become a reality.

I welcome Mr. Mr. Arun Narke, the immediate past president of the IDA. Under his guidance, we started the work for the 46th Dairy Industry Conference.

To this Valedictory function, I also welcome Dr. N. Balaraman, the former Vice Chancellor of the Tamil Nadu Veterinary and Animal Sciences University.

I warmly welcome Mr. T.K. Mukhopadhyaya who is with us today on the dais. I welcome the Chairmen, Board of Directors of cooperatives and managing directors, CEOs, and officers of cooperatives and corporates, officer-bearers and members of the IDA, sponsors, exhibitors, scientists, technocrats, researchers, teachers, students, and press for this session. I thank you for your participation in the 46th Dairy Industry Conference.

For this conference, there were 2076 registrations, and this is the highest for any DIC so far held in the southern region. However, we are yet to touch the all-India level because during the 44th DIC at Karnal, the total no of registrations were 2450. Hopefully in the ensuing conferences, the organizers would aim towards it.

I thank you all for the overwhelming support. May God bless us! Jai Hind!

Address

By
Dr. G.S. Rajorhia
President, Indian Dairy Association

Friends, I am pleased to hear that during his six months tenure, Mr. C. Kamaraj as Managing Director, Tamil Nadu Dairy Cooperative Federation has been able to increase the market for milk and milk products by 10%. Just imagine if this trend continues perhaps this figure will multiply, every year by 20%. This will be a great achievement for Tamil Nadu Dairy Federation and the adjoining state of Kerala. The Kerala Government should take lessons from this great achievement of Mr. Kamaraj. We are pleased to have Mr. P.T. Gopalakurup, Chairman, MILMA sitting with us and I would like to congratulate him again for receiving the prestigious Dr. Kurien Award on the first day at this Conference. We request him also to address this gathering at the concluding function.

We have just heard the salient features of the proceedings and recommendations that have emerged out during these three days deliberations. These recommendations are only indicative of the problem with regard to efficiency in milk production, processing, marketing, food safety and distribution. I would like to say that the recommendations shall be suitably reviewed, edited and published in Indian Dairyman. Important recommendations shall be pursued vigorously for their implementation at various levels for the benefit of dairy farmers and consumers. A few things that emerged from these three days deliberations are basically selection of productive animals to increase profits, feeding and maintenance of milking animals using economic rations, ensuring proper animal health coverage by promoting the use of ethno veterinary drugs since you are all aware that large amount of antibiotics used for prevention and curing of diseases of animals leaves behind veterinary drug residues.

Unfortunately, antibiotics are unduly used to promote the growth rate of calves that needs to be culminated or reduced. Otherwise this use of antibiotics in animals both for milk and meat production is likely to create serious health problems among the human beings. This Conference also discussed the possibility of cutting the processing cost and also the packaging and marketing expenditure. Dairy Plants in this country are able to return some 80%

of the consumer price to milk producers. There is a great scope for us to reduce the cost further so that the portion of profit could be further enhanced from 80 to 85 per cent.

A clear message has been received from this Conference that there is a need for us to combine information technology to enhance productivity, also new technologies for production and processing and adoption of validated methods which are ready to check adulteration. Several speakers talked about food safety concerns. Food Safety and Standard Authority of India are going to issue a mandatory requirement that each food establishment in the country will have one or two trained food safety supervisors so that these people who are trained in food safety issues take care of the food quality and safety. And there again a provision has been made that at the time of mandatory inspections, this requirement will be a prerequisite.

Skill development and entrepreneurs who generate employment right in the village through Kaushal Vikas Kendras is an idea which was given by some speakers. Therefore, this Conference has infused many innovative ideas for efficiency. We have miles to go in achieving reasonable taxation regime as in milk production multitude of inputs will attract GST.

I believe, IDA recommendations will receive suitable attention from the governments and they take up these issues seriously both at Centre as well as State levels. The CEC is grateful for all that the Conference organizers have done. In my opinion, there will be no person who will say that there is one or two complaints with regard to accommodation, transport, hospitality and technical presentations. I am personally thankful to my friend Dr. Satish Kulkarni who has so ably planned technical sessions enabling you to learn many things.

I would like to place on record my great appreciation to the organizing committee of this Conference notably Mr. C.P. Charles, Chairman, IDA (South Zone); Dr. P.I. Geevarghese, Secretary General with his team of zonal committee members; faculty from Kerala Veterinary University; Dairy Science College and the students. I am really thrilled to see the involvement of these young students everywhere supporting, helping and guiding the delegates.

We are pleased to have Dr. N. Balaraman, Former, Vice Chancellor, TANUVAS with us at the Valedictory Session and I wish him good health.

Thank you very much.

Address

By

Mr. P.T. Gopalakurup

Chairman, Kerala Co-operative Milk Marketing Federation Ltd.

Hon'ble President of IDA, Dr. G.S. Rajorhia; Mr. C. Kamaraj, IAS, Managing Director of Aavin; Mr. Arun Narke, former President-IDA; Dr. N. Balaraman, former Vice Chancellor, TANUVAS; Mr. C.P. Charles, Chairman, IDA(SZ); Mr. Mukhopadhyay, CEC Member-IDA; Dr. P.I. Geevarghese, Secretary General, 46th DIC; chairmen of various milk unions from different parts of the country; academicians; farmers; students; ladies and gentlemen.

When it was decided by IDA to organise the 46th Dairy Industry Conference in Kerala, the matter was conveyed to me by Dr. P.I. Geevarghese at the same moment and I felt so happy and promised my support for the same. Today the recommendations of the conference were read out here. They are indeed important for the dairy industry. But I personally believe that required divergences in accordance with the changing times are imperative for the sustainability of dairy farming and industry.

The increase in milk market of Aavin in Tamil Nadu as expounded by its Managing Director is a positive sign. In Kerala, the market of 'MILMA' is almost stabilized. It should be noted that the dairy farmers are not ready for a compromise; they should get remunerative price. Value addition of milk and expanding milk products market can only assure a better price to the farmers. The industry should escalate its competency in value addition and marketing.

The world is now under a single umbrella. You cannot have different price for milk in different states. If so, it creates a negative effect; and that is not virtuous for the dairy farmers. Government should arbitrate in this. Milk production is the only source of livelihood to small holder dairy farmers. If price is not received in time; it affects them badly. Regarding demonetization, GST, A1-A2 milk etc., we need effective intervention to support the farming community.

The animal productivity needs to be improved for better profits. Government utilizes very less amount in dairy sector. The percentage in the total plan is insufficient. The investment by Government to this sector shall surely give additional results.

The technical and farmer's recommendations of the conference should reach the proper authorities to make appropriate decisions and plans. Dr. Verghese Kurien was able to bring the farmers to self-sustenance through co-operatives in a bigger way. The sustainability and efficiency of this sector shall be continued with our concerted efforts.

I appreciate all the personnel who worked behind the success of the Conference.

Thank you all. Jai Hind.

Address

By

Mr. C. Kamaraj, IAS

Managing Director, Tamil Nadu Cooperative Milk Producers' Federation (Aavin)

Good afternoon to all!

First of all, I must thank the organizers for inviting me to the valedictory function of the 46th Dairy Industry Conference. Especially, I want to thank Mr. C.P. Charles, my friend and Chairman of the 46th Dairy Industry Conference.

Respected Dr. G.S. Rajorhia, President, Indian Dairy Association, respected Mr P.T. Gopalakurup, Chairman, MILMA, Dr. P.I. Geevarghese, Dr. N. Balaraman, other dignitaries, and ladies and gentlemen,

It is my pleasure to represent Tamil Nadu at the Conference. What are the current issues and what is happening in the dairy industry across the country as well as in Tamil Nadu is of significance?

I hope that the proceedings over the last two days have been refreshing for the minds and intellect of the participants, given the topics taken up here for discussion, which are relevant to the need of the hour. In the deliberations here, many suggestions and alternatives have been put forth for meeting the challenges ahead.

It is a well-known fact that India is the world's largest milk producer with 40 crore litres per day. As the CEO of the Tamil Nadu Cooperative Dairy Federation, I am proud that the State contributes significantly to the national milk production. Our brand Aavin functions on the Anand pattern, founded by the Father of the White Revolution. We have more than 8000 milk producers' cooperative societies comprising 4.5 lakh pouring members in 17 district unions. They produce 32 lakh litres of milk per day. Our daily milk procurement has increased from 20.6 lakh litres in 2011 to 30 lakh litres today, indicating an annual growth rate of 8%.

During the last six years, Aavin has invested more than ₹ 800 crore under various schemes of the Government of India, the Government of Tamil Nadu, and from its own funds to create dairy infrastructure. Due to these schemes, our milk processing capacity has increased from 30.72 lakh litres to 43.22 lakh litres per day. We propose to increase the milk processing capacity to 60 lakh litres per day by 2028.

Recently, the Government of India has announced another dairy infrastructure development fund. Tamil Nadu will be going to avail a major share from this fund, and we are going to create a lot of infrastructure. We are going to use this fund to extend our marketing hugely. In order to promote the clean milk programme and get quality milk from farmers, 341 bulk milk coolers (BMCs) have been installed so far. Another 248 BMCs will be installed in the year 2018. By 2022, we propose to introduce can-less reception of milk at all dairies in Tamil Nadu.

Recognizing the significance of the balanced cattle feed, Aavin is supplying cattle feed to its members. Profitable units are subsidizing the cattle feed cost by ₹ 2 to ₹ 4 per kg. As a result, the cattle feed sale went up from 500 metric tonnes in 2012 to about 7000 metric tonnes per month in 2017. I hope we are going to increase the cattle feed sale to a minimum 15,000 metric tonnes per month as we are creating awareness about the importance of the balanced cattle feed all around. We are telling farmers about the benefits of

this feed. For example, if you give the balanced cattle feed properly to milch animals, solid non-fats in their milk will automatically increase, and for the same level of milk production, farmers will get additional income, which every farmer should aim for.

Aavin is a household name. Our motto is not only to please the producer but also to satisfy the consumer. We have diversified our products offerings for the market. The sales revenue of ice cream and fermented products has increased from ₹ 180 crore to 264 crore in the first six month.

Air-conditioned hi-tech parlours having children play area and ample parking space have been established across the State. About 16 have been set up in Chennai metro and 35 in the districts. An innovative effort to establish 200 parlours in colleges and educational institutions in the State is underway. About 80 parlours have been opened so far and the remaining will be opened shortly.

In another innovative move, the sale of Aavin products has been introduced in 266 dairy societies this year. We have taken this initiative so that farmers should know what are the products made out of their milk. We have taken products like ice-creams, milk badam mix powder, milk khoa, and milk sweets to the dairy societies where farmers are pouring their milk. In the first phase we proposed to do sales of these products through 600 dairy societies. As of now, we have covered 300 dairy societies, and the rest will be covered, shortly.

Now, most of the major milk producing states have surplus SMP. This is actually a real challenge for the dairy industry. Two months back, I had been to Delhi for a conference where it was indicated that more than 1.25 lakh metric tonnes SMP is lying as surplus. In fact, the Government of India has been advising the States to go in for the school milk programme by giving milk powder or milk. The surplus SMP has resulted into locking up of funds which in turn has affected the payment to milk producers. To cope with the SMP problem, the Government should intervene by cutting import of milk products. This is essential to safeguard the interests of Indian farmers.

The cooperatives can also unite to solve the SMP problem. They should decide not to sell SMP below ₹ 200 per kg. This collective measure would ensure that all the major cooperatives and milk producers stand together on the SMP issue. However, this measure is very difficult to implement because we need to make payment once in 10 days; therefore, there will be a pressure on the federation and the societies to settle dues.

The Government of India could also intervene by offering ₹ 50 per kg of SMP as an interim measure of the minimum support price of 200 per kg SMP which will be an incentive to the farmer. I think this conference shall take this forward by bringing this to the notice of the Government of India so that some kind of decision could be arrived at.

On the behalf of Tamil Nadu, I request the IDA to recommend two important proposals to the Government for the growth of the dairy industry. At present about 18% GST is being levied for the SMP conversion. This levy should be removed to reduce the cost of production of SMP. Recently during an interaction, the Government of India Secretary advised the concerned States that their Hon'ble Chief Ministers should write a letter to the GST Council or the Prime Minister of India. We are preparing to make this representation.

The Government of India should treat the income of dairy cooperatives as agricultural income so that income tax is not levied on the profit of milk cooperatives. Because it's a very strange that district cooperatives in some States are facing difficulty in settling farmers' payment. However, at the same time some unions are paying tax. Treating dairy cooperatives' income as agricultural income would pave the way for more capital investment in the dairy sector and more milk processing would come under the organized sector..

Researchers should also focus on the commercially viable dairy farming and modern nutrition management of cattle to achieve the country's vision of doubling the farmers' income by 2022. United we stand. Let us unite and strive to transform the status of the Indian dairy industry and the Indian farmer from the sufficiency to efficiency.

I once again thank the organizers for giving me the opportunity to speak here. We have represented Tamil Nadu fairly here. We are about 60-70 people here. Hope at the next conference, we would be able to depute more persons so that our people could learn from the knowledge exchange. Today we have visited the exhibition that has been organized wonderfully. In fact, we have picked up many new things from the exhibition. These conferences definitely give excellent knowledge to all sections of the dairy industry.

Thank you very much!

Vote of Thanks

By

Dr. P.I. Geevarghese

Secretary General, 46th DIC

The most respected dignitaries on and off the dais, dearest ladies and gentlemen,

Words are not enough to express my happiness and satisfaction. My feelings are bounding at great heights to convey my gratitude to all of you. The three-day Conference went methodically and with ease. The appreciation in good words and gestures received from all of you is precious and heart filling.

I can undoubtedly presume that the 46th Dairy Industry Conference is a big success and it matched the superior levels of the previous conferences. This could happen only because of the hard work, support, assistance and determination of a group of experienced leaders of all generations and talented youngsters.

At the close of the 46th Dairy Industry Conference, I have been assigned the duty of proposing vote of thanks for all who supported us directly and indirectly in making the conference an outstanding success. First and foremost, I would like to thank the Almighty for showering all blessings for the smooth conduct of the programme without any shortfalls.

Today, the dais is blessed with the presence of many dignitaries. The newly elected President of the Indian Dairy Association Dr. G.S. Rajorhia, was the focal strength in organising the conference by way of leadership and direction. You may remember that the delicious lunch served on February 8 was sponsored by the President, IDA. In his presidential address he has given an overview of the Indian dairy Industry and the role of the Indian Dairy Association in the development of dairying in the country.

On behalf of the Organising Committee, I express my sincere thanks to Dr. G.S. Rajorhia for his presence and delivering the presidential address. Mr. C. Kamaraj, IAS, Managing Director, Aavin, has delivered a thought-provoking speech wherein he has described the present dairy situation in South India, particularly Tamil Nadu. We are thankful to him for his presence in the valedictory function of the conference.

The entire dairy fraternity is happy to see that the Dr. Kurien Award winner for the year, Mr. P.T. Gopalakurup, Chairman, KCMMF, is with us today and for delivering the keynote address. May I take this opportunity to congratulate him and express my sincere gratitude for his gracious presence and a valuable speech.

The initiative for organizing the Conference began while Mr. Arun Narke was the President of the Indian Dairy Association. Mr Narke released the logo of the Conference during August 2017. The entire DIC team is thankful to him for his support for the organisation of the Conference and presence here. Doyens of the dairy industry, Dr. N. Balaraman, former Vice Chancellor, TANUVAS, and Mr. T.K. Mukhopadhyay, CEC member, IDA, are here with us today for gracing the occasion. On behalf of the Conference Secretariat, I take this opportunity to thank them.

Words are not there to express my gratitude to Mr. C.P. Charles, Chairman, IDA (SZ) for the encouragement, support and guidance extended by him in organising this Conference. I am sure that without him the conference would not have been so successful.

valedictory session

The entire DIC team is indebted to him and thank him profusely for his presence and welcoming the audience. Moreover, as the senior President of ABT Industries, he supported us by providing a computer and printer with which we initiated our activities. Hor this kind gesture, I am thankful to Mr. Charles.

As you all know the 46th DIC was unique by way of producing a curtain raiser film, the release of a special stamp, a separate curtain raiser session, online registration of delegates, e-poster presentation, unique ways of publicity in print and visual media, and so on. The organisation of the Conference was entrusted to different committees constituted after three/four times deliberations at Bengaluru. The committees had representatives from all chapters in the South plus industry representatives. I express my sincere thanks to all committee members for making the conference a unique one.

The first day saw the dignified inaugural session, followed by the farmers' seminar and the poster session. On the second day, there were deliberations on various subjects at our three venues. The third day also was especially good as it saw fruitful discussions on the theme 'Dairying: Sufficiency to Efficiency'. My congratulations to all poster and best paper award winners, Fellows, patrons and best women dairy entrepreneurs from different zones.

I am also very much thankful to the invited guests who participated in the inauguration, particularly the Hon'ble Minister for Dairying and Animal Husbandry, Adv. K. Raju, Animal Husbandry Secretary, Mr. Anil X, and other dignitaries who blessed the occasion.

I am also thankful to Dr. D. Babu Paul, IAS, for coming here for delivering a very impressive and thoughtful Dr. Kurien Memorial Oration Lecture.

I am extremely grateful to all Central Executive Committee members of the Indian Dairy Association for the support they have extended to the Conference. Many of them were kind enough to act as either Speaker or Chairman in the technical sessions.

It may be noted that the conference is organised by the IDA (SZ), chaired by Mr. C.P. Charles, and I am extremely thankful to the Indian Dairy Association (South Zone) Executive Committee members for the unrestricted support they have given for the successful conduct of the Conference. Many of them travelled several times to Thrissur, acted as Chairman/Co-Chairman of different committees/sessions.

The support extended by the IDA Kerala chapter is remarkable and thanks are owed to each and every member.

The delegate registration (paid + free) was 2076, the highest among the Conferences held in the South. It was for the first time that online registration of delegates was done and 1289 registrations were completed online. Thanks to the Registration Committee members headed by Mr. Bacha Gowda and Convener, Mr. S.R.Shyam Suraj.

The soul of any Dairy Industry Conference is the exhibition. In the initial stage, many expressed apprehensions that as Kerala does not have a good number of dairy-related businesses, the possibility of getting exhibitors is difficult. The exhibition, which was opened on the first day, had 124 stalls overcoming all our calculations. The exhibition impressed about 15,000 visitors who shared an encouraging feedback about it. I am thankful to M/s Koelnmesse YA Tradefair Pvt. Ltd. for organising the exhibition on behalf of the IDA and to all companies who participated in the exhibition. I am also thankful to the committee headed by Dr. K.S. Ramachandra and Mr. B.V. Dharmendra for coordinating the activities.

Our technical sessions were meticulously planned and conducted without any lapse of time. That was made possible by the thorough planning by our Technical Session Chairman, Dr. Satish Kulkarni, Vice Chairman Dr. A.K. Beena, and Convener, Ms. K.B. Divya along with committee members. I am thankful to all speakers, chairmen, co-chairmen, conveners and rapporteurs of the technical sessions.

I am thankful to the authors who have contributed articles to the souvenir. The 318-page souvenir was printed in Thiruvananthapuram and was brought to convention centre on the morning of February itself. I express my gratitude and congratulations to Dr. R. Rajendra Kumar, former Dean and Chairman of the Publication Committee, Convener, Mr. G.R. Jayadevan and members for taking up the responsibility of coordination and printing the souvenir in time with very good layout.

The cultural programmes were entertaining and showcased the ethnic traditions of Kerala. Thanks to the Chairman Dr. N. Sankaran, Convener, Ms. B. Indu, and members for organising the well appreciated cultural programmes. Thanks to the student artists who performed on the first day of the Conference.

I am sure that all of you enjoyed the dishes served during breakfast, lunch and dinner. The Food Committee, headed by Dr. B.V. Venkateshaiah and Convener, Er. Aswin S Warrier, together with their team, has taken maximum efforts to satisfy the palates of delegates from all over India. Thanks to the Food Committee team.

For the first time in the history of the DIC, we have introduced the concept of e-poster which ended in a grand success. Thanks to the Chairman, Dr. P.K. Dixit, Convener, Mr. R.Rejeesh, and members of the Poster Committee for their efforts.

The services rendered by the Transport and Accommodation committee were also remarkable and special thanks to Chairman, Mr. Jagannatha Rao, and Convener, Dr. K.S. Anil, and his team for the excellent arrangements.

The arrangements for the inaugural and valedictory functions went without any flops and the credit goes to Dr. B.C. Ghosh, Chairman, and Ms. Smitha J Luckose, Convener. A big thank to the Programme Management team.

Availability of funds decides the success and failure of any event, and the fund flow for the DIC was mainly from sponsors. I am extremely thankful to all the platinum, gold, silver sponsors, lunch/dinner and technical session sponsors. Special thanks to Dr. S.N. Rajakumar, Treasurer, IDA Kerala Chapter, and Finance Committee Chairman, Mr. C.P. Charles, Co-Chairmen, Dr. Bandla Srinivas and Dr. P.K. Srivastava, for managing the funds in the most efficient manner.

The hard work put up by Dr. C.T. Sathian as Vice Chairman of the Farmers Seminar, Dr. P Sudheer Babu and Dr. P.T. Suraj as Vice Chairman and Convener, respectively, of the Press and Media Committee, Dr. Lijimol James, Secretary, IDA Kerala Chapter, is worth mentioning.

I am grateful to the Veterinary University authorities for permitting the staff and students to play an active role in the organisation of DIC.

The support and help extended by the Dairy Development Department and various units of MILMA is also worth mentioning and I am thankful to them.

Thanks are due to the Management of the Adlux Convention Centre, one of South India's biggest convention centres, where all facilities are available for organizing such a conference and exhibition under one roof.

Kerala Voyages as our travel partner for the Conference have done immense work in coordinating the transport and accommodation of delegates and officials. Thanks to them for the arrangements and for tour packages promoted by them.

I am grateful to the event managers Watermark, Ernakulam for the stage, light and sound arrangements. The Venue Committee headed by Dr. P. Sudheer Babu, Dean Dairy Science College, coordinated well with the event managers to create a visual impact for the conference.

I owe my gratitude to all my fellow members of the IDA, colleagues, friends for the successful conduct of the Conference.

I am extremely thankful to the faculty and students of the Dairy Science Colleges located in Mannuthy, Trivandrum, Pookode, Kolahalamedu; Food Technology College Thumburmuzhi; and College of Veterinary and Animal Sciences, Mannuthy. They have helped us in the meticulous planning, organization and conduct of the Conference. Special thanks to all student volunteers whose active involvement was well appreciated by all delegates.

I am indebted to the artists who have designed the mementos, suppliers of presentation and gift items included in the delegate kit, designers and printers of the brochure and certificates.

The print, visual media and the FM radio helped us in taking the programme to the public. I am thankful to government departments and the media.

Special thanks are due to the police department, local self-government, fire and safety department and also to the medical college nearby for providing the ambulance facility.

If I have left anybody in the Vote of Thanks please note that it is not intentional.

As the Secretary General of the Conference I feel proud of organising a mega event without much lapses. And, now I feel relieved from the tensions I was carrying for the last ten months.

Once again I thank you all for making the 46th DIC a grand success and hoping to meet you all in the 47th DIC scheduled at Patna.

Thank you! Jai hind!

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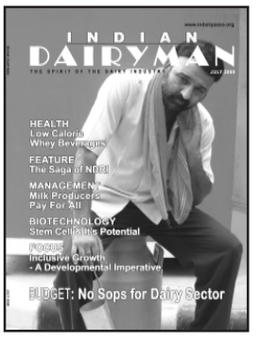
INDIAN DAIRYMAN
Guidelines for Authors



General

The manuscript of any article will be received for publication with the understanding that it has not already been published or simultaneously submitted or accepted for publication elsewhere. The article once approved shall be included in the list of approved articles and it will be published as per the priority determined by the Editorial Desk.

Type of Contribution

The manuscript should be related to dairy industry only and should enrich the knowledge of our readers. A research paper is not considered for publication in the Indian Dairyman.

Submission of Papers

Two copies of the manuscript of the proposed article along with a photograph of the author(s) may be sent. The manuscript should be neatly typed in double spacing (either laser printout or Electronic typewriter output). Do not send the material typed with manual typewriter. The manuscript may also be sent through e-mail at **indiandairyman68@gmail.com**, so as to minimise the possible errors in printing.

The manuscript should not exceed 6-8 pages of A4 size of the Indian Dairyman format. The article must be concise and free of any discrepancy. Standard abbreviations should be used in the text. Words given in italics should be underlined. All figures, sent along with the articles, should be drawn on butter (transparent) paper or should be a laser printout (no xerox copy).

Language

All papers should be written in English.

Title

Generally, the title of the article should not exceed 15 words.

Introduction

The introductory part should give appropriate background, clearly stating the objectives of the paper.

Conclusion

Author must draw a conclusion at the end of the paper.

References

Literature references should be given at the end of the article and the same should also be referred in the text, if necessary.

Address

Authors and co-authors must indicate the name of the organisation they are working for, their designation and full address (including phone, fax, and e-mail address, if available).

Theme:
Dairying – Sufficiency to Efficiency

Recommendations of the 46th Dairy Industry Conference

The 46th Dairy Industry Conference was held from 8 to 10 February 2018 at Kochi, Kerala. The major recommendations which emerged are listed below:

Growth Sustainability in Dairying:

In order to sustain the growth in milk production, it is essential to offer remunerative price for milk. Further to enhance quality and efficiency, it is essential to create infrastructure for cold chain involving bulk milk cooling, efficient transportation and logistics at the village level. Additional budgetary allocations should be made for modernization of processing facilities. It will be desirable to diversify the existing product-mix to production of high value products having long shelf life to improve economic efficiencies.

The newly created infrastructure facilities may be integrated with other agro processing activities including fruits and vegetable for the holistic growth of the rural economy.

Policy Intervention for Growth and Efficiency:

It is necessary to bring about the convergence of Government policies to ensure equal opportunities for private, cooperative and public sector undertakings for robust growth of dairying. The conference recommended the creation of a nodal financial agency to address the problem of liquidity arising from the accumulation of huge stocks of milk powder and smoothen the cash flow. GST on ghee should be reduced to 5% from the existing rate of 12% to increase its sale and realize value of milk for payment to milk producers.

Milk Production for Doubling Farmers' Income:

In view of the shrinking natural resources, "animal population-driven dairying" needs to be discouraged and "technology-driven dairying" should be encouraged to ensure higher productivity and production.

A need for faster multiplication of superior germplasm by adopting multiple ovulation, embryo transfer and sexed semen techniques is emphasized. Efforts should be made to develop skilled personnel in this area of specialization.

Farmers should be encouraged to adopt safe milk production practices and to receive higher milk prices based on the microbial quality apart from the chemical composition.

Dairy industry may adopt Block Chain Technology for storing data related to livestock and to enable the financial institutions, insurance and developmental agencies to use the data to facilitate financial support without the requirement of an intermediary. The conference suggested the creation of a system for online sale and auction of livestock. Since this system would involve the sensitive social ramification, this initiative may be taken up by the Government agencies.

Vaccination process for the control of mastitis should be enlarged to cover all states of India to reduce the loss in milk production and to maintain robust heath of animals.

It is also suggested to strengthen fodder seed supply linkage with the stakeholders and to promote agro eco-system resilience to counter climate changes.

Healthy Life-style Foods:

The country must take up funding of research on Life-style and healthy foods, conduct safety and toxicological studies on new generation additives and to devise appropriate mechanism for technology transfer from developers to end users.

Efforts should be made to develop appropriate trained manpower for managing the National and International regulatory requirements in view of the changing regulatory environment across the world.

RECOMMENDATIONS

Finance and Marketing:

The farmers need to be paid remunerative price for raw milk taking into consideration the cost of milk production as advocated for other agricultural commodities. The prices need to be reviewed from time to time keeping in vie the dynamics of the input costs. The farmers need to be supported with adequate supply of inputs like balanced feed, processed paddy and wheat straws, veterinary care and breeding support and other similar inputs at minimal costs to encourage dairy development.

The farmers need to be supported with credit facilities for expanding their dairy business at lower interest rate similar to those made available for other agricultural activities.

The machineries used in dairy operations should be exempted from taxes to encourage technology-driven dairy development.

Quality and New generation additives:

The regulators should insist on the basic analysis of chemical and microbiological quality of milk received at the dairy plants. Milk processing units should ensure a well-established protocol for cleaning and sanitization of equipment and adopt methods to check the residual chemicals at the end of cleaning operations.

The processing plants need to employ professionally qualified and trained-personnel for plant operations and quality assurance. The governments and dairy plants must support research to develop kits for rapid detection of antibiotics, pesticides and Aflotoxin M1 and also to control measures to prevent adulteration.

Skilled and Human Resource Development:

Skill building should be initiated by combining vocational and entrepreneurship training programmes to facilitate the support to small dairy enterprises by matching supply to current demand of workers with skill and competencies.

Dairy industry should partake in short-term trainings as well as recognition of Prior Learning (RPL) programmes under National Schemes like PMKVY, DDUGKY, National Livestock Mission, etc.

The conference recommends the constitution of an independent dairy sector skill council and integration of skill development activities of different institutions/ organizations to enable development of skilled manpower with both entrepreneurial and employable skills for sustainable livelihood. Expansion of skill development activities for large and wide coverage can be achieved through open and distance learning and e-learning modes by adopting Public Private Partnership model for developing employable skills at the grass-root level.

Animal Health and Sustainability:

Suitable farm level policies need to be developed by the governments for ensuring good animal health keeping in mind the socio-economic dynamics and existing competitive resource advantages.

Concerted efforts in linking the milk producers to the organized supply-chain need further strengthening to ensure relatively stable milk prices that consumer can afford.

The income to the farmers from the milk sale needs to be exempted from income tax as is applicable to agricultural commodity.

Dairying should be treated at par with agricultural activities and the SOPS that the Central and State Governments offer especially on matters of taxation, subsidies and credits must be extended to dairying as well.

Newer Issues for Next Generation Dairying:

Information technology should be adopted by all service providers and stakeholders in bovine productivity enhancement programmes across the country, all service providing organizations in the country should be brought together to adopt and operate through a national level information network.

All the animals (bovines) should be uniquely identified with ear tags having a 12 digit number as per international standards to track the movements and all other activities and to generate relevant data. Information Network for Animal Productivity and Health (INAPH) should be the common system to be adopted by all the stakeholders to create data, carry out analysis and generate reports so that compiled data and required analysis would be available at national level which would further facilitate planning process with high accuracy in future.

Efforts should be made for the scaling up of the small scale model of dairy farming with 2-3 animals to increase their herd strength up to 40-50 animals for better socio-economic status of milk producers and all support should be extended to facilitate this growth.

46th Dairy Industry Conference
FEEDBACK

Dear Mr. Charles,

This is to express my thanks for organizing the 46th DIC at Kochi, Kerala. It was one of the best organised DICs with huge participation from all sections. My special thanks to the members of all the committees of the 46th DIC for making the event a great success!

Dr. G.S. Rajorhia, President, IDA

Heart is full of happiness, feeling so happy for a very successful event, the 46th DIC. The South Zone has kept its uniqueness. Special thanks to all visionaries, leaders, team members and especially volunteers. Great job done.

Dr. P.K. Srivastava, Dairy Consultancy, Bangalore

Hearty congratulations and compliments to all the committee chairmen and members for the most successful organisation of the 46th DIC.

Dr. N.K.S. Gowda
ZEC Member-IDA (South Zone)

The 46th DIC was a well conducted programme. Both the Conference and the Exhibition were organized in an excellent manner.

Dr. P. Sudheer Babu
Dean, Faculty of Dairy Science and Technology,
Kerala Veterinary and Animal Sciences University

Dear Sir,

I thank the Chairman-IDA-SZ, "Captain Cool" Secretary General, Chairman, Conveners & members of all the Committees for making the 46th DIC as the role model and a memorable conference! Great contributions were evident from the Conveners of Registration, Technical, Transport/ Accommodation, Stage & Programme committees.

The Kerala Chapter of IDA-SZ from God's Own Country, proved the 46th DIC as the best, with its meticulous, honest and sincere work.

Special thanks to the cheerful student volunteers who have contributed with their meticulous jobs!

I feel very proud to be part of this conference. I salute to all the contributors!

Dharmendra, B.V.
ZEC Member-IDA (South Zone)

Sir,

The 46th Dairy Industry Conference, held at Angamaly, Kochi from Feb 8 to 10, was very unique in every aspect. I had the opportunity to attend many Dairy Industry Conferences in the recent years but the one which was organized by the IDA South Zone and anchored by the IDA Kerala Chapter stands unique in terms of the meticulous way in which every part of the Conference was organized. The warm hospitality extended to the delegates and the guests need special appreciation. The venue and the arrangements made for the delegates were commendable. The Technical Sessions planned were of international standard and appropriate to the theme of the Conference.

I am sure the delegates who attended the 46th DIC will definitely have great memories about the event during their life time. Once again, I would like to congratulate the Organizing Committee for the meticulous planning and conducting the event and earning the appreciation of all who attended the conference.

Dr. R. Rajendra Kumar
Former Dean, Faculty of Dairy Technology
Kerala Veterinary and Animal Sciences University

It is without question that the 46th Dairy Industry Conference, Kochi 2018 was the cynosure of attention both on the national as well as the State dairy scene.

This precision planned activity however could be achieved only through the meticulous planning and careful forecasting of demand by a team of dedicated committee members and a far sighted Secretary General.

For more than a year, meetings of various committees have been scheduled, which I being a member, have personally attended and I was amazed at the amount of care that was taken in planning the programme so that even the minute details were taken care of.

No stone was left unturned as the Kerala Chapter of the IDA and the South Zone of the IDA worked hand in hand to give the participants a true taste of an authentic Kerala experience while looking into the finest detail of ensuring that the meet was up to the mark from the technical point of view as well.

I can not but congratulate the Secretary General and the Chairman of the South Zone for having guided their committee members to such heights of excellence in organizing and conducting the 46th Dairy Industry Conference, Kochi 2018 in a manner befitting the expanse of this event.

Dr. C. Latha
Dean, College of Veterinary and Animal Sciences,
Kerala Veterinary and Animal Sciences University,
Mannuthy, Thrissur, Kerala

Dear All,

Words are not enough to express my gratitude to one and all involved in making the 46th DIC a mind boggling success.

The grandeur of the Conference will reverberate and linger in us for many years to come. With due respect, I thank Prof. Geevarghese and his vibrant & dynamic team for their inestimable contributions. I express my gratitude to the Chairmen, Co-Chairs, Conveners and members of different committees that are effectively engaged in organising the Conference. I profusely thank my ZEC members for sustaining us throughout keeping up our motivation level. My sincere thanks to the immediate past and the present President, office bearers and CEC members and the Secretary & staff of IDA HQ for their support. I feel I have not done anything great. If you feel that I have done something great, it is because of Prof. Geevarghese & his team including the students.

Regards,

C.P. Charles, Chairman, IDA (SZ)

I have been attending the Dairy Industry Conferences being organised by the Indian Dairy Association for 20 years. By and large, this annual event has been a good conclave for dairy fraternity. I deem it relevant to place on record my feedback about the conduct of the 46th DIC, which might serve as useful information for continuing the good things and rectifying the lapses in the ensuing DICs.

- The pre-event preparations in terms of announcements, brochure, curtain raiser, constitution of various committees, periodic review meetings, press & publicity and use of electronic media for communication, definitely were excellently planned & meticulously implemented. So to say, an excellent beginning for 46th DIC was made.
- The entire event was facilitated by about 100 student volunteers dressed in uniforms and it was exemplary. Every committee utilised the volunteer services for smooth and cordial functioning. Definitely, it made a difference in the better treatment of delegates and guests during the event.
- The committees constituted for execution of various activities deserve a special applause for their nice planning and meticulous execution.
- The Curtain Raiser Lecture delivered by Dr. R.P. Aneja was most informative and interesting besides being highly critical. This event was introduced for the first time in DIC, largely to fruitfully engage the delegates during the time gap between registration formalities and inaugural session. It went very well and was well attended. Compliments to the initiative of Dr. Satish Kulkarni, Chairman, Technical Sessions Committee.
- From the inaugural session to the valedictory session, spread over two and half days, the deliberations went reasonably well. The session on 'Economics and social issues' was unusual as it was completely a women's session.
- The matters relating to registration, accommodation & transport and food were well dealt to the satisfaction of the delegates and guests. The registration kits loaded with compliments were well appreciated. Delegates were too happy with non-vegetarian dishes, while vegetarian dishes could have been better served.
- The cultural events presented on both the days were good, but it was too lengthy. In order to hold the interest of the audience, it could have been shorter.
- The Poster Session was unique and exemplary, since for the first time in the history of DIC, e-poster presentations were introduced. The Committee in general and particularly, Mr. Rejeesh R., Mr Jayadevan G.R. and Dr. Rajendra Kumar deserve loud approbation for their meticulous planning and execution of it.
- If the past has any relevance, fund collection in Kerala for organising DIC was a herculean task. But, this time, to anybody's surprise, the untiring efforts of particularly Mr. C.P. Charles, Chairman, IDA(SZ) and Dr. P.I. Geevarghese, Secretary General, 46th DIC, yielded comfortable receipts, enabling to meet the expenses of this mega event. Indeed big compliments to them and their team!
- To epitomize, IDA South Zone, in the recent times, enjoyed the distinction & appreciation from the CEC and delegates, for conducting the DIC in an orderly manner and in a model way. I am very happy to state that 46th DIC held at Kochi could maintain the distinction under the able coordination and cool mindedness of Dr. P.I. Geevarghese and Mr. C.P. Charles, besides the entire team of members.

Dr. P.K. Dixit
Principal Scientist, NDRI Bengaluru and
Life Member of IDA

Life is about creating and living experiences that are worth sharing. I was fortunate enough to bring into being such a great experience and it's an honour to share.

Being a volunteer, I was not aware about the duty I was entrusted with in the first instance. But as the D-day approached, we were tensed, timid and faint hearted. We were blessed with the teachers who were with us, guided us and paved our way to the great event– 46th Dairy Industry Conference.

I had been privileged to witness this mega event and to meet many great academicians. I was enlightened by various technical sessions which included speakers from diverse domains of the dairy industry. Alongside, it was a moment of astonishment to come across with the farmers and to click photographs with them, creating an everlasting memory.

Moreover, the successful conduct of the 46th DIC proved Helen Keller right, who once quoted "Alone we can do so little, together we can do so much".

Ms. Ashna Xavier
2015 batch B. Tech (Dairy Sci. and Tech.) Student,
College of Dairy Sci. and Tech., Mannuthy, Thrissur

46th Dairy Industry Conference

(February 8-10, 2018)

A Great Thank You from the Bottom of Our Hearts…

A big challenge accepted and completed with utmost satisfaction is the feeling lingering at the close of the 46th Dairy Industry Conference 2018. The preparations for the Conference brought along immense pleasure and closeness among the dairy fraternity of the South Zone and the Kerala Chapter in a befitting manner. The relentless effort of a year had finally yielded desired fruits. The three-day Conference went by in a most systematic manner. This could happen only because of the hard work, support, assistance and determination of the Organizers, Sponsors, Supporters, Cooperatives, Corporates, Officials from the Government of Kerala, Faculty and Students of the Dairy and Food Technology Colleges of the Kerala Veterinary and Animal Sciences University and so on. We owe our gratitude to all. The appreciation and gesture in good & worthy words received from each and every one is precious and heart filling.

There was a tremendous delegate registration, which went beyond 2000; the highest number in the Dairy Industry Conferences so far organised in Southern Zone. Online registration was implemented for the first time and it had crossed thousand. Release of 'My Stamp' and introduction of e-poster were a few highlights of the Conference and for the first time in the history of the DIC. The Technical Sessions were to the subject and handled efficiently by eminent Speakers and Professionals across the globe and we thank them for their participation and contribution.

We take this opportunity to thank the support and assistance extended by the Central Executive Committee Members of IDA, Executive Committee Members of IDA (SZ), Sponsors, invited Guests and Speakers, our partners in exhibition, event management, press and media, etc. Special thanks are due to the Delegates, Exhibitors and Suppliers.

Kudos to various organizing committees and their members and the staff of Adlux Convention Centre for their immense contribution. We thank each and every one for the assistance rendered and dynamic involvement in the Conference.

With Kind Regards,

(C.P Charles)
Chairman, IDA (South Zone)
& 46th DIC 2018

Dr. P.I Geevarghese
Secretary General
46th DIC

(G.S. Rajorhia)
President
Indian Dairy Association

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Circulation of "Dugdh Sarita" would be around 4000 plus copies and may be more. It would be circulated to all the IDA members, including institutional members in cooperative and private dairy sector, academic institutions and all concerned Government departments. It would serve as a medium for effective dissemination of new techniques, best milk practices and increasing production among other things. "Dugdh Sarita" will be featuring articles, news and views, case studies, success stories and much more. Its mission would be to spread across the dairy sector measures which would reap immense benefits and which would propel our farmers and in turn the entire dairy industry towards greater successes.

IDA already publishes two journals, "Indian Dairyman" and "Indian Journal of Dairy Science" which are widely acclaimed and subscribed to at national and international levels.

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The 66th AGBM of IDA was held on 10th February, 2018 at 4:00 pm at Adlux International Convention and Exhibition Centre, Angamaly, Kochi (Kerala), it was attended by 109 members. The President formally declared the AGBM open.

1.0 Welcome Address

1.1 Dr. G.S. Rajorhia - President, IDA welcomed the members present in the 66th AGBM.

2.0 Confirmation of the minutes of the 65th Annual General Body Meeting held at mumbai on 18th February, 2017.

2.1 The minutes have already been circulated to all the members vide letter No. IDA:65AGBM:2678 dated 15/03/2017 to which no comments have been received. The minutes were accordingly confirmed.

3.0 Presentation of Annual Report of IDA by the President.

3.1 Dr. Rajorhia, President-IDA presented Annual Report of Indian Dairy Association (IDA) for the period under review which was inclusive of activities of IDA(HQ) and Zones/State Chapters as well.

3.2 Following are the highlights of the report presented by the President:

45th Dairy Industry Conference — The 45th Dairy Industry Conference (DIC) was held during February 16th-18th, 2017 at Mumbai Convention and Exhibition Centre, Goregaon, Mumbai. The theme of the Conference was "Climatic Change and Dairying".

The DIC was attended by a large number of delegates where several topics of technical and general nature were discussed. The recommendations of the DIC were published in the special issues of the Indian Dairyman during April & May 2017. The recommendations were sent to various concerned Govt. Departments, Cooperative Institutions and Private Sector Dairy Plants for implementations.

Other Activities of IDA Head Quarter, New Delhi – IDA had convened four meetings of the Central Executive Committee during the year 2017-2018 on May 15 & August 21, 2017 and January 20, & February 07, 2018. Many important issues related with the functioning of IDA were discussed and appropriate decisions taken.

IDA continues to publish the monthly Journal "Indian Dairyman" and "Indian Journal of Dairy Science" on bi-monthly basis. It is a matter of pride that these two journals have received world wide acclamation and their circulation continues to increase significantly.

The quality of both the journals has appreciably improved. The Indian Dairyman is published on the 1st day of each month and despatched to members on the 2nd day.

The much-awaited Hindi bi-monthly magazine titled

"Dugdh Sarita" was launched on 9th September 2017 to cater to the needs of Milk Producers.

The IDA (HQ) building constructed during 1970-71 needed renovation both in the internal and external structures. The meeting hall and the President's enclosure fell short of space. The CEC at its consecutive meetings discussed this issue and accorded their approval to undertake the renovation work on modern lines with a view to increase the space in the meeting room. The work has been awarded in the month of August, 2017 and renovation is in the final stage.

IDA has initiated several actionable measures on issues impacting growth of dairying at national level. Given the importance of the governmental reform of the national tax system i.e. GST and its relevance to dairying, a meeting on GST was called by IDA on 12th June, 2017 primarily for seeking tax exemptions on milk and milk products. This was attended by eminent IDA stake-holders and recommendations were forwarded through Department of Animal Husbandry Dairying and Fisheries to the Government of India.

A meeting on Pre-budget memorandum was held on 9th October 2017 with a focus on direct and indirect taxes. The recommendations of the Pre-budget Memorandum have been forwarded to the Government of India.

Two important historic dates in the dairy sector calendar are the National Milk Day and the World Milk Day. IDA (HQ) organised the World Milk Day on 1st June at IDA House, New Delhi and the National Milk Day on 26th November at IDA (WZ) Mumbai. The Zonal and State Chapters of IDA also celebrated the National Milk Day programmes at local levels.

With the approval of CEC, a new office space for IDA(WZ) has been purchased in Mumbai at the total cost of ₹ 2.9 crores with contribution of ₹ 1.65 crore from IDA(WZ) and ₹ 1.25 crore from IDA(HQ). The West Zone office is located in A-501, Dynasty Business Park, Andheri-Kurla Road, Andheri (East), Mumbai.

IDA has also planned to undertake rainwater harvesting in the campus of IDA House, New Delhi. According to Government stipulations, it is a mandatory ecological requirement for all offices having an area exceeding 1000 sq. ft. IDA has given the work order for this in December, 2017.

CEC - IDA Elections for the term 2018-2020.

Elections of CEC-IDA were completed on 9th January, 2018 and the result was announced on 10th January, 2018.

IDA Membership — The strength of IDA members has crossed 3500 this year for which the members of CEC of Zones and Chapters and membership department of IDA deserve to be complemented. The membership of IDA continue to be accessible online.

Overseas/International Visitors – IDA is receiving World Wide recognition. During the period of the report, IDA House was visited by many foreign delegations/ dignitaries who held discussions with the President and other members of the Association. Some of them are as follows:

- A farmer delegation from Argentina and Chile visited IDA House on 25th February, 2017 and had wide ranging discussions with IDA officials on the emerging dairy sectors of the respective countries.
- A delegation from Australia and New Zealand comprising of 22 dairy farmers led by Mr. Adrian Dale Curtis Price visited IDA House on 3rd April, 2017. The delegation explored the possibilities of investments in dairy farming in India and to study the pattern of dairy activities undertaken by Indian farmers. IDA was represented by the President together with Dr. R.S.Khanna, Shri Ram Chander Choudhary and Shri N.K.Bhanot.
- A delegation from Mongolia led by Team Leader Ms. TUUL Tuvshinbayar visited IDA House on 20th April 2017. Mr. Munkhjargal B., Executive Director, NDDB and National Coordinator of Mongolia was also part of the delegation. The delegation was very much impressed with the growth of dairy development in India and sought the technical assistance from India in promoting dairying in their country. It sought support of IDA in organising training programmes in areas like milk production, breeding, processing, value addition and marketing etc. The President-IDA alongwith Dr. R.N.Kohli and Shri N.K. Bhanot represented IDA in the meeting.
- A meeting was held on 1st December, 2017 at IDA HQ with Ms. Ikegaya Fumiko, KMC, Inc. Japan who was representing the Japan International Cooperation Agency (JICA). JICA had commissioned a study on "Dairy Sector in India" for the purpose of identifying

areas which need technical and financial support. Dr. R.S.Khanna and Shri N.K. Bhanot focused on the functioning of the Indian Co-operatives, Private and Government sectors to inform JICA on the status of the dairy sector specifically milk handling, processing and marketing.

Further he presented a brief report on the activities of Zones and Chapters based on the material provided by the Zones/Chapters as under:

EAST ZONE – Elections of ZEC members of IDA (EZ) for the term 2016-2019 were held. A training programme on Clean Milk Production was organised for the farmers of 24-Paraganas (North) in collaboration with M/s. Red Cow Dairy Pvt. Ltd. More than 150 farmers attended the training programme. Five ZEC meetings were held during 2016-17. An All India Essay Competition for students of various dairy science/food technology colleges/universities on the topic "Milk for Today's consumers" was organised. A one day National Seminar on "A Dairy Snap Shot 2017" was also organised at West Bengal University of Animal & Fishery Sciences. The 26th AGBM was held on 5th August, 2017. The National Milk Day was celebrated on 26th November, 2017 to commemorate the 96th birth anniversary of Late Dr. V. Kurien through R.K. Mission, Kashipur and Barahanagar.

Bihar State Chapter - Bihar State Chapter IDA(EZ) organized a workshop in association with National Productivity Council, Patna on Energy Conservation on 31st July 2016. The Chairman, Bihar Chapter, Shri Sudhir Kumar Singh addressed the gathering and suggested the measures required to achieve Energy Conservation in Dairy Industry. The Bihar State Chapter took an opportunity to diversify its activities by associating it in the Seminar organized by Bihar Industries Association (BIA) on 26th September, 2016 at BIA building, Patna on the occasion of 70th AGM of BIA. On the occasion of World Food Day on 16.10.2017 a seminar was organized by Bihar State Productivity Council, Patna in association with the IDA-Bihar Chapter. The topic of the seminar was "Family Farming Feeding the World, caring for the Earth" NABARD & Mukhyamantri Sodh & Mulyankan Pariyojna of Govt. of Bihar co sponsored the seminar. On the eve of 96th Birth anniversary of Dr. Verghese Kurien, the Chapter in association with Vaishal Patliputra Dugdh Utpadak Sahakari Sangh Limited, Patna celebrated National Milk day in the premises of Hazipur Dairy Plant of VPMU on 26.11.2017. More than 2000 farmers and people associated with the dairy industry attended the function. The Chapter in association with Krishi Vigyan Kendra, Bihar Veterinary College, Vaishal Patliputra Dugdh Utpadak Sahkari Sangh Limited, and People for Animal (PFA) organized a Mega Animal Health Camp cum Kisan Ghosthi at Pachaura Village on 22.10.2016.

SOUTH ZONE – The South Zone of the Indian Dairy Association had a challenging year with initiation of activities towards organising the 46th Dairy Industry Conference. The place of the conference was fixed at Kerala and Prof. (Dr.) Geevargheese was nominated as the Secretary General for the Conference. The Office Bearers of the IDA-SZ were recast with Shri CP Charles as Chairman and Dr. K.S. Ramachandra as Vice-Chairman in place of Shri Ravikumar Kakade and Dr PK Dixit respectively. The ZEC meeting was convened six times during the year and took important decisions with regard to organising the 46th Dairy Industry Conference. The World and National Milk Days were celebrated with National Dairy Research Institute, Bangalore. IDA-SZ also participated as a sponsor in the Seminar organised by the Alumni Association of NDRI, Bangalore. IDA-SZ provided a financial assistance of ₹ 30000/- to Kerala Chapter to conduct the training, seminar etc., and ₹ 20000/- to Alumni Association of ICAR-NDRI, Bangalore, to organise a brain storming session on 'Indigenous cattle'. The TN Chapter has become active during this year with the renewed EC. A white paper on 'Sponsoring participants to Dairy Industry Conference' and 'Financial Sponsorship by IDA-SZ' had been approved by the ZEC and implementation will commence in 2017-18. Ms. Veda Seetaram Hegde of Uttar Kannada district was nominated and honoured with 'Best Woman Dairy Farmer' award of the South Zone in the 45th DIC held at Mumbai. As on date, IDA(SZ) membership stands at 494.

Kerala State Chapter - Kerala State Chapter had three Executive Committee meetings. A three day Hands-on training in the "Preparation of milk products for small scale entrepreneurs" was conducted at Department of Dairy Technology. The chapter also celebrated World Milk Day on 1st June, 2017 and World Environment

Day on 5th June, 2017. One day awareness Seminar on Quality and Food Safety Management System was organised on 20th June, 2017. A National Seminar on "Food Adequacy and Climate Change: Strategies for Sustainable Food Production" was held on November 3 and 4, 2017. A one day Workshop on Farmer to Farmer Extension was organised on 27th November, 2017 as a part of National Milk Day 2016. Kerala Chapter in association with AFST (I), Thrissur prepared the wall calendar for the year 2018 incorporating details of dairy and food science celebrations.

WEST ZONE – The IDA(WZ) organized the 45th Dairy Industry Conference on a theme "Climate Change and Dairying" and IIDE 2017, Exhibition on Dairy Farming, Milk Processing, Packaging and Marketing of milk products from 16th to 18th February 2017 in Mumbai. The Conference was attended by 1350 delegates whereas the exhibition was visited by 6437 visitors. The exhibition was spread over 8000 sq. mt. area with 188 exhibitors comprising 23% overseas companies. IDA (WZ) purchased its own office at A 501, Dynasty Business Park, Chakala, J B Nagar, Andheri Kurla Road, Andheri (East), Mumbai - 400 059. Further, the 1285 sq. ft. office is renovated and converted into 'State-of-the-Art' training centre with a seating capacity of 30 trainees and is well equipped with audio and Video Conferencing facilities. The IDA West Zone celebrated National Milk Day and 96th Birth Anniversary of Dr. V Kurien on 26th November 2017 at IDA (WZ) office. The Zone had undertaken membership enrolment drive and increased the IDA Membership substantially. To take the policy decisions, the ZEC met three times during the financial year.

Gujarat State Chapter - Gujarat State Chapter organised three Seminars on "Current Position of International and National Dairy Sector and Factors Affecting Profitability of Milk Production", Seminar on "Enhancing Effectiveness of Animal Husbandry Input Services", and Seminar on "Raw Milk Quality - the first Critical Step to Ensure Food Safety".

NORTH ZONE - The Annual General Body Meeting for the year 2016-17 was conducted at India International Centre along with the Seminar on 10th June 2017. Four ZEC meetings of IDA (NZ) were conducted on 29.03.2017, 12.05.2017, 09.09.2017 and 27.11.2017. A national seminar was organised on the theme "Dairying for doubling the farmers' income" on 10.06.2017 at India International Centre, New Delhi and was a great success. IDA North Zone Executive Committee elections for 2017-2020 were held on 22.08.2017 and new Executive Committee took over the charge on 09.09.2017 headed by Shri S.S. Mann as Chairman.

Rajasthan State Chapter - Rajasthan State Chapter of IDA celebrated World Milk Day on 1st June, 2017 and National Milk Day on 26th November, 2017. Annual General Body meeting for the year 2016-17 was held on 14th January, 2017 in Jaipur.

Punjab State Chapter - Punjab Chapter in collaboration with Punjab Dairy Development Board and Milkfed Punjab celebrated World Milk Day with a great fervor and enthusiasm at Livestock Complex, Sector 68, Mohali on 1st June 2017. The celebration was a multifaceted activity. On this occasion a seminar on the topic of "Milk for Health and Prosperity" was organized. The District level winners of the essay competition conducted by the Board on the same topic throughout the Senior Secondary schools of the State were awarded cash prizes. The Punjab Chapter in collaboration with Punjab Dairy Development Board and Baani Milk Producer Company, Patiala celebrated National Milk Day at Dairy Training and Extension Center, Sangrur (Punjab) on 26 November 2017. The highlights of the celebration included a technical seminar on the topic of "Importance of Milk for the formation of a Strong Society" with a Prize Distribution for the District level winners of the essay competition on the same topic. The Punjab Chapter actively pursued the membership drive during this period, as a result of which one life member and 14 ordinary members got enrolled and membership of 15 members was renewed.

The President expressed his gratitude to all the CEC members for their whole-hearted co-operation and thanked them for their keen interest in the activities of the Association.

The members appreciated the Annual Report presented by the President and approved the Report and adopted the following resolution:

RESOLUTION No. 66/01

"Resolved that the Annual Report of IDA presented at the 66th Annual General Body Meeting (AGBM) is hereby approved and adopted as presented in the agenda papers".

4.0 **Presentation of financial report of the association alongwith the audited statement of income and expenditure for the financial year 2016-2017.**

4.1 Shri N.K. Bhanot, Secretary (Establishment) presented the Financial Report for the year ending 31st March, 2017 alongwith the audited statement. The General Body approved the Financial Report and adopted the following resolution:

RESOLUTION No. 66/02

"Resolved that the Financial Report of IDA for the financial year 2016-2017 presented in the 66th AGBM is hereby approved".

5.0 **Approval of the proposed budget of IDA(HQ) and its Zones for the Financial Year 2018-2019.**

5.1 Budget for IDA(HQ) and all the four Zones/ Chapters for the financial year 2018-2019 as brought out in the agenda papers were considered and approved except provisioning of ₹1.25 crores from IDA(HQ) for purchase of office space for IDA(SZ) and adopted the following resolution:

RESOLUTION No. 66/03

"Resolved that budget for IDA(HQ), all the four Zones/Chapters for the financial year 2018-2019 shown in the agenda papers are hereby approved except provisioning of ₹ 1.25 crores from IDA(HQ) for purchase of office space for IDA(SZ)".

6.0 **Approval of the appointment of auditors and their remuneration for the year 2018-2019.**

6.1 The appointment of M/s SSR & Co., New Delhi as the auditors of IDA(HQ) for the financial year 2018-2019 was approved by the AGBM and the following resolution was adopted:

RESOLUTION No. 66/04

"Resolved that Chartered Accountant, M/s SSR & Co., New Delhi are hereby appointed as Auditors of IDA for the financial year 2018-2019 at a remuneration of ₹ 49,500/- per annum for annual audits and ₹ 4,950/- per month for filing Audit and TDS/Service Tax Returns etc.".

7.0 **Any other matter brought to the notice of the President, provided it has been brought with 7 days prior notice.**

7.1 **The members raised following issues in the meeting :**

- That all the members be informed about the policy made on funding for purchase of property/site for offices of Zones/Chapters before purchase of office space for IDA(WZ) in Mumbai.
- That necessary amendments are required in the criteria for enrollment of membership based on Dairy qualifications and their conversion to Life Membership.
- That updation and up-gradation of IDA Website is required with uploading of important decisions taken by the CEC and important matter concerning all the members on the website from time to time.
- Re-constitution of Committees for selection of Awards and review the Guidelines for various Awards.
- Eligibility criteria for voting rights of members for election purpose to be reviewed. Similar to the tenure of IDA President confined to two terms of three years each, the tenure of other office bearers of the CEC, ZEC and State Chapters be also limited to two terms of three years each.

The President assured the house that the above issues would be taken-up for deliberations by the CEC Committees nominated for the purpose and suitable recommendation at the earliest.

Meeting ended with vote of thanks to the Chair.

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cmc/mn/newpack/04-2018(11)

Developing Institutional Mechanism to Ensure All time Remunerative Milk Prices to the Dairy Farmers

Livestock/Dairy Sector in India:

Livestock production and agriculture are intrinsically linked, dependent on each other, and both are crucial for overall food security. According to estimates of the Central Statistics Office (CSO), the value of output of livestock sector at current prices was about ₹ 5,91,691 crore during 2015-16 which is about 28.5% of the value of output from agricultural and allied sector. The Cooperative Milk Unions have procured an average of 42.55 million kg per day of milk during the year 2015-16 as compared to 38 million kg per day in the previous year recording a growth of 12%. The sale of liquid milk by the Cooperative Dairies has reached 32 million liters per day during the year 2015-16 as compared to 31.24 million liters per day registering a growth of 2.7% over the previous year. (Adapted from Annual Report 2016-17, Department of Animal Husbandry, Dairying and Fisheries Ministry of Agriculture and Farmers Welfare, Government of India).

India's milk production is constrained mainly due to factors such as low genetic potential, falling water table, shrinking land resources due to urban sprawl, and insufficient feed and fodder resources. India's organized dairy sector comprises only 20 percent of the total milk production, which includes government supported dairy cooperatives and private sector dairies. From fiscal year 2010-11 to 2015-16, fodder and oil cake prices increased at a compound annual growth rate of 11 and 8 percent respectively while milk prices increased by only 7 percent; this squeezed farmer's profits. At present, some state governments provide financial subsidies to dairy cooperatives so that they can offer higher milk prices to farmers. According to NDDB Report the total installed processing capacity of the dairy cooperative sector is approximately 43 million liters per day; however, the total registered processing capacity of private dairy sector is 73 million liters per day.

B.S. Beniwal
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Increasing Milk Production in India

For the fiscal year 2014-15, the average milk yield of indigenous cattle, water buffaloes and exotic/crossbred cattle was 2.5, 5.2 and 7.2 kg per day, respectively. What should be the breeding policy in what part of India? And in that part also there are different micro-environments and public sentiments. What should constitute the feed and fodder of the milch animal where there is meagre land (3.5 % of total cultivated) under fodder cultivation? What should be the Exim policies with respect to milk-derived products? How should the latest animal husbandry technologies be extended to the dairy farmers? The quantum of concerns is very large and it appears that addressing all the related issues is practically not possible. But simply paying remunerative prices to the milk producer will do the trick. Some State Dairy Federations giving reasonable purchase prices of milk have registered a lot of progress. The farmer getting good price is inspired to produce more milk and by any means arranges to feed his animal with good quality feed/ fodder and rear it properly. He subscribes to the Govt policies proactively. It enhances milk production resulting in more procurement by the Federation and less overhead costs per kg of milk. This ultimately results in surplus revenue and higher prices to the milk producer.

Mounting Pressure on State Dairy Federations

When the Dairy Federations were being established they did not get sufficient milk for processing and even if they could get it, the mentality of general public would not prefer milk filled in pouches. With change in public perception over time the State Dairy Federations (SDF) could get and process sufficient quantities of milk. This growing business (and de-licensing) attracted private players also and because of competition, the milk producers could now hope for better prices. But it resulted in a very high pressure on the SDFs. During the summer season when milk availability was scarce, the consumers

would put pressure on the SDFs for milk supply. But since the Federations could not get enough milk in their milk shed area, they were forced to reconstitute a large portion of milk from skimmed milk powder and white butter. This would adversely affect profit margin of the Federations, who invested a lot to develop their milk shed. The private companies by paying nominally higher price would purchase major portion of the milk. But during flush season, these private players discourage purchase of milk leaving the responsibility of purchasing total surplus milk on the SDFs. Consumers then shift to other sources which are nominally cheaper. The Federation, to cope up with the surplus milk, is forced to convert it into skimmed milk powder (SMP) and white butter which again adversely affect its profit margin. On occasions, the situation becomes so miserable that SDFs are not even able to source milk commodities to maintain supplies to the consumers in lean season and unable to convert surplus milk into commodities even after using their full processing capacity. There is uncertainty about the disposal and prices they are likely to get for the commodities produced by them. It was only because of this condition that government of India had to come to the rescue of the SDFs. In the early months of 2016, the SDFs had huge quantities of SMP lying with them which was going to expire.

Hence, on the persistent demand of the federations, to save the spoilage of the SMP and to save the federations from great losses it amended the guidelines of RKVY scheme to incorporate a new component "Working capital for reprocessing of milk powder to extend shelf life of stocks nearing expiry date" as a short term measure valid until 30th June, 2016. The competition between the private players and the state federations is not fair. After de-licensing in 1992 the private parties have little or no control of the government/federation regarding quantity of milk processed after registration.

National and International Milk Market

The national as well as international milk market is extremely volatile and unpredictable. It has been observed that the price of Skim Milk Powder (SMP) on 02.04.2013, per MT was USD 5142 while within about two years it slashed down to USD 1419 on 04.08.2015 (**Fig.1**). Needless to say that the world is now turned as a global village and it has impact in every nook and corner of a single event. In the national milk market also it can be seen from **Fig.4** that the SMP price tendered by various SDFs/ NDDB to Delhi Milk Scheme (DMS) have shown wide variations in price over time. On 24.05.2014 the

Fig 1.: SMP Prices (USD/MT, FAS)
(Source: www.globaldairytrade.in)

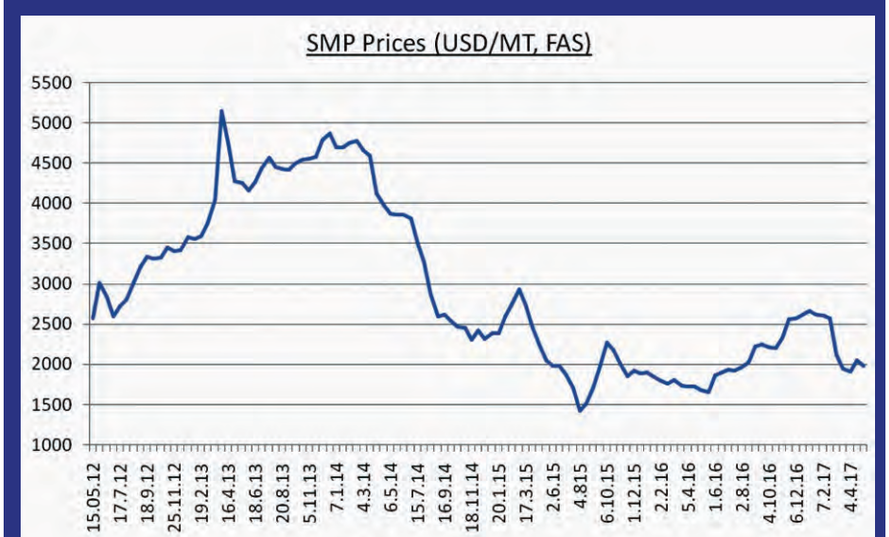


Fig 2.: Export Import Comparison of Casein etc and Skim Milk Powder (SMP)
(Compiled from Export Import Data Bank: Commodity-wise, Department of Commerce, Govt of India)

(Quantity in Thousand kg)

Hscode 35011000 **Commodity** Casein, Casein Derivatives, Casein Glues **Export**								
2007-08	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**
14,700.1	8,314.6	8,148.3	10,284.2	801.6	13,635.9	11,343.6	7,887.7	5,497.8
HSCode 04021010 **Commodity** Skimmed Milk **Import**								
210.16	64.54	3,504.0	20,209.0	44,627.4	0.05	5.85	671.78	0.05

rate was ₹ 310.08 per kg but on 10.08.2015 it went down to ₹ 147.5 because there was no channel to dispose off the excess SMP lying with the Federations. The prices being paid to the farmer have also been fluctuating to the utter disadvantage of the milk producer. A perusal of the data in **Fig.3** indicates that there are spikes downwards in the farm gate prices. The NMG prices on which the milk was procured in Delhi (FOR) are sometimes just the same as the SDF had been giving to the producer. It was disadvantageous to the state dairy federation also as it has to incur overhead cost of transportation, chilling, pasteurization and FOR costs. To the contrary the consumer prices have kept on increasing persistently in spite of the low purchase prices. The low prices given to the farmer discourages him to give quality feed to his animals because it is costlier and milk production becomes uneconomical. The farmer gives the animal bare minimum feed and cheap fodder/ forage etc. Slowly the milk producing capacity of the milch animal decreases because of low supply of essential nutrients and later on the health of the animal also deteriorates and it is not able to exploit its genetic potential. Subsequently, even if the milk prices to the dairy farmer are increased it takes considerable time to improve the condition of the animal and to exploit its genetic potential to produce more milk by feeding quality ration. By the time the animal reaches its optimal level the prices again fall down and the same cycle is repeated which is highly deleterious to the dairy sector of the country.

Export/Import of Milk Products from India

It can be seen from the **Fig.2** that India exported casein and related products. It can also be seen that during the same period India imported huge quantities of SMP. This is quite surprising and seems imprudent. For producing 3 kg of casein about 100 kg of skim milk is required while for producing 9 kg of SMP the same quantity i.e., 100 kg of skim milk is required. It can be made out very easily that in some years we used nearly the same quantity of milk to produce casein and related products and then we imported SMP to regenerate the same quantity of milk. Thus, on the one hand the government of India paid incentives to the exporters of casein (an avoidable loss to public exchequer) and on the other hand government of India spent its foreign exchange on importing the SMP (which was avoidable).

Milk Handling by Organized Sector

Of the total milk produced in India the organized sector handles only 20%, of which half is handled by the cooperatives and more than half by the private players. The milk production in 2015-16 was 155.5 MT i.e. about 430 million kg per day. The installed capacity of the cooperative sector is 43 Million Litres per day while the registered capacity of the private sector is 73 million kg per day. Assuming 10% of procurement of total milk production the figure comes out to be nearly 43 million kg per day by the cooperative and private sector each. This indicates that the cooperative sector is using its full installed capacity on an average per year while the private sector is using only 59%. Here there is a cue. When the market is not lucrative the private players withdraw from the market and the whole responsibility to collect farmers' milk comes to the state dairy federations. Contrary to this when the milk market is lucrative the private players become active and pay a little more price in the milk shed areas of the state dairy federation and procure maximum milk. It is to note that the federation invests time and money to develop the milk shed area and the ignorant farmers turn to the private players for short term gains which ultimately harms the cooperative federation and the farmers themselves. The competition between the private player and the federation is thus unfair and the federation doesn't get a level playing field. Though a fair competitive market/procurement is in the interest of the farmers and keeps the federation vigilant and active but the unfair competition brings overall harm to the farmers, farmers' cooperatives and the nation as a whole.

A perusal of the export data will indicate that nearly all of the exporters of SMP and casein are private players who take advantage of the flaws in the Exim policies of India.

Inferences/Conclusions

From the above discussion it can be concluded that (i) the dairy farmer is uncertain whether he will be getting value for his produce or not (ii) the SDFs are uncertain about their milk procurement and consumer supply, both in terms of volume and price (iii) the private players' registered capacity is too underutilized (iv) Export Import of milk derived products has not been well planned (v) milk market is highly volatile at national and international level as well. No institutional mechanism has been developed to take care of these issues and we are always in a fire fighting mode. Although the inherent problems of the dairy sector are numerous, a module is proposed which can ensure predictable remunerative prices, perennially to the milk producer; certainty of availability and disposal of milk commodities to the SDFs and justifiable export and import of dairy products. This will boost the milk

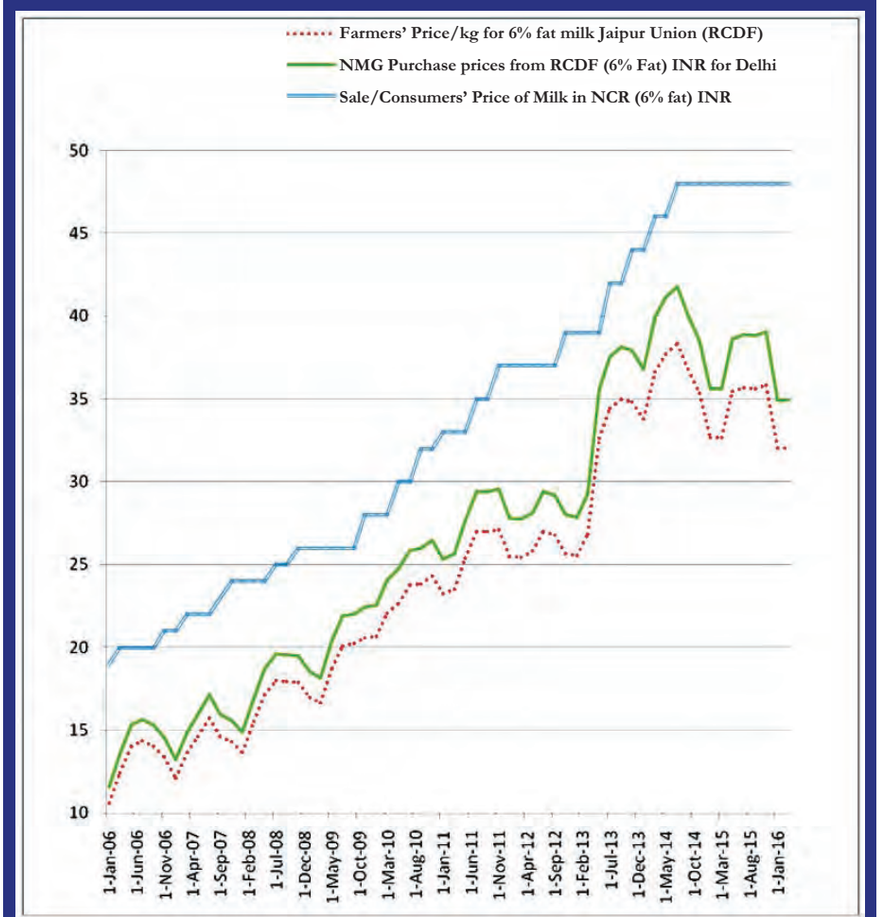
production in the country and greatly improve the financial health of the dairy farmers and SDFs as well. This will be in consonance with the Prime Minister's program "Doubling the Farmers' Income by 2002".

Plan of Work/Working Module

Of 5.7 lakh MT of SMP predicted to be produced in 2017, 2.5 lakh MT is expected to be from the cooperative sector. Of this, about 70,000 MT is likely to be produced by Amul which is expected to opt out of the proposed plan and hence the rest of the cooperative sector will produce a total of about 1.8 lac MT SMP. It has been observed that a deficit or surplus of 60,000 MT of SMP on national basis can badly affect, rather throw most of the Federations out of gear and they are unable to cope up with such a situation. The Nodal Agency will guarantee purchase and supply of the surplus/deficient SMP from the Federations under all conditions. It has been assumed that in extreme conditions the Agency has to manage maximum 60,000 MT of supply or usage of SMP deficit or surplus in the country.

Fig 3.: Price Comparison: Farmers' Price of Jaipur Union (RCDF), Sale Price for DMS Delhi And Consumers' Price in NCR

(Source: Rajasthan Co-operative Dairy Federation and Delhi Milk Scheme, GOI)



Nodal Agency

A Nodal Agency has to be set up that will develop a corpus fund/buffer to support the Federations. The contribution will be made by the Federations and thus no budgetary support from the government will be required. Keeping in view the uncertainty of the prices of the milk/milk commodities on National and International level, the Federations should be interested in joining the Nodal Agency and contribute.

Formation of the Nodal Agency

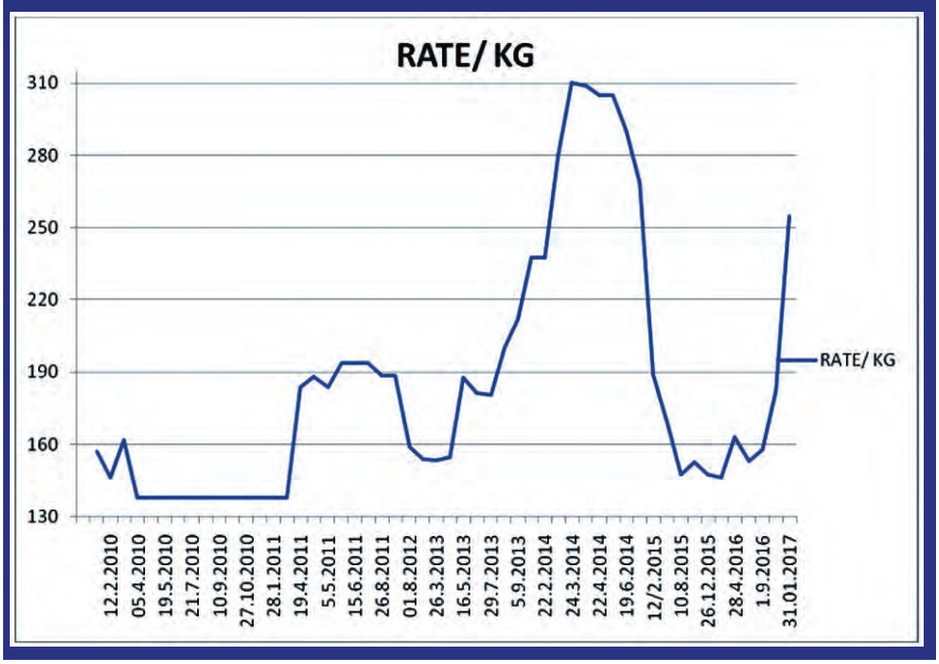
The Nodal Agency can be formed/constituted by pooling officials from various related organizations which will guarantee purchase and supply of SMP to the State Dairy Federations. It is estimated that in the calendar year 2017, 5.7 lacs MT of SMP will be produced in India. Cooperative sector is likely to produce about 2.5 lacs MT out of it. Of this, about 70,000 MT is likely to be produced by Amul which is expected to opt out of the proposed plan and hence the rest of the participating SDFs will produce a total of about 1.8 lac MT SMP. It has been observed that a deficit or surplus of 60,000 MT of SMP on national basis can badly affect, rather throw most of the Federations out of gear and they are unable to cope up with such a situation. The Nodal Agency will guarantee purchase and supply of the surplus/deficient SMP from the Federations in all conditions. It has been assumed that in extreme conditions the Agency has to manage maximum 60,000 MT of supply or usage of SMP deficit or surplus in the country.

Corpus Fund generation by the Agency

The contributions calculated here are nominal and the Federation should not hesitate to pay for that. Milk production in the calendar year 2017 is taken as 160 Million Ton. Milk production per day = 160 Million

Fig 4. : Sale Price of Smp INR/kg to DMS for Delhi by Various State Dairy Federations/NDDB

(Source: Delhi Milk Scheme, GOI)



T/ 365 = 438356168 kg. So milk collection by cooperative sector per day is 438356168/10 = 43835617 kg. It shows that the cooperative sector is handling its full installed capacity that is, 100%.

Assuming that the milk handled by Amul per day is 13835617 kg per day (for the sake of rounding of the other figures), the milk handled by other cooperatives comes to 3 crore kg per day. The average rate per kg paid by the Rajasthan Cooperative Dairy Federation up to March 2017, to the farmers was ₹ 33.13, so it can be assumed that the purchase rate per kg in the calendar year 2017 will average ₹ 35/- (on national basis).

Milk handled by private organized sector per day is only 4.38 crore kg, while the registered handling capacity is 7.3 crore kg. Thus, the private organized sector is using only its 59% of registered capacity. It clearly indicates that the private organized sector increases its activity only when the market is profitable for them. Thus, they eat up the share of the profit of SDFs. When the market is not profitable the private organized sector either completely stops or decreases its activity further to the disadvantage of cooperative sector. Thus, the SDFs do not get a level playing field. Assuming that 70% capacity utilization should be optimum on an annual average basis, below which the private sector should give some token surcharge to the State Dairy Federation in the area of which they are operating. At 59% level, the short fall in the optimal utilization of capacity is 11%. A token surcharge of 1% of the Farm Gate Price of milk on the short-capacity will be legitimate and thus the total revenue generated per year from this under utilization of capacity will be:

73000000*11/100*35/
100*365= 102.58 crore,
say ₹ 102.6 crore per year.

Cost of production of skim milk powder

Assuming three percent moisture in SMP and cost of milk is Rs 35 per kg, the cost of snf as calculated using National Milk Grid formula (where 48 percent weightage is given to snf) plus overhead cost, the total cost of SMP:

= 35*48/100* (100-3)/9 = 181.06 + overhead cost
= 181.06 + 12 = say ₹ 193 per kg.

Working of the Nodal Agency

- The Nodal agency will collect a token surcharge from the private milk processors running under optimal capacity (playing foul) on behalf of the Federation. This surcharge will be remitted to the Federation at an appropriate time. The total surcharge as calculated above comes to ₹ 102.6 crore. (Govt will have to notify this through a legislative action.)
- The Nodal Agency will guarantee purchase of SMP produced by the Federation ensuring 10% profits. All the stock of SMP with the Federation will be the property of the Nodal Agency (like the chest of banks is with Reserve Bank).
- The Nodal Agency will guarantee supply of required SMPs to the deficient Federations at a profit of 20 % on the cost of production (₹ 193/kg).

....continued on page 170

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- In the purchase and sale process of SMP to the Federations, the Nodal Agency will have a surplus of 193*10/100*180000*1000 = ₹ 347.4 Crore
- Additionally, the Nodal Agency will collect 1% of the total purchase expenditure on milk by the Federation. The total collection in one year on this account will be: 30000000*35/100*365 = ₹ 383.25 crore.
- Thus, the total reserve revenue that the Nodal Agency will be having in a year = 102.6 + 347.4 + 383.25 = ₹ 833.25 Crore
- Assuming that there is a slump in the market and the Federation has to cope up with extra SMP, the Nodal Agency will buy it giving 10% profit to the Federation (that is, 193 + 19.3 = ₹ 212.3) and in case of distress sale by the Nodal Agency (say ₹ 112.3 per kg), the total loss incurred by the Nodal Agency will be 60000000*(212.3-112.3) = ₹ 600 crore. From the total revenue generated by the Nodal Agency, it will be able to bear this loss comfortably.
- Assuming that there is a shortage of skim milk powder with the cooperative federations and the Nodal Agency, which has guaranteed supply of SMP to the Federations at 20 percent profit (193+38.6= ₹ 231.6/ kg), is compelled to purchase SMP at a very high price say ₹ 350/Kg from open market; the total loss to the Nodal Agency will be 60000000*(350-231.6) = ₹ 710.4 Crores. Thus, the Nodal Agency will be able to bear the losses from the token funds that it has generated from the Federations itself. Though, the Nodal Agency will keep an eye on the National and International market and will not allow such a situation to come.
- If there are no heavy fluctuations in the milk market, the Nodal Agency will plough back the contributions of the Federations proportionately for the development of the infrastructure by the Federations.

Important Considerations

- The assurance that the excess/deficit milk (SMP) will be purchased/supplied by the Nodal Agency will greatly relieve the Federations and they will be able to plan their schedule without having such botherations of surpluses or deficiencies. In such conditions, the Federations will be able to plan ahead and give remunerative prices to the dairy farmer for his milk.
- The remunerative price to the farmer will encourage him to produce more milk through improved practices and he will subscribe to the various schemes of the government. He will be inspired to keep more animals and provide best care to them as advised by the specialists. This will help achieving milk production targets of the country. He will also subscribe to the innovative ideas like alternate feed sources/ration balancing/ breed improvements programs, etc.
- Since all the surplus revenue is to be ploughed back to the Federation in proportion to their contribution, they should not hesitate to pool their money with the Nodal Agency.
- The Nodal Agency will not interfere in any of the policies of the government or day to day activities of the Federation. However, it may take some extra responsibilities if so asked by the government/federations.
- There may be some reservations regarding the profit margin on SMP by the federations. Those who are generally surplus will demand that the profit margin should be higher than 10% while those who are generally deficient will demand that the profit margin in the SMP supplied to them should be less than 20%. But this can be discussed and resolved.
- The losses, if any are in fact not losses to the Nodal Agency rather they are greatly reduced losses to the Federations through this mechanism. In this way, the Federations will be enjoying profits from this arrangement.
- Quantum of contribution to the Federation should not be a serious cause of concern as the Nodal Agency will spend money only to facilitate better functioning of the Federation. All the savings/unutilized fund of the Nodal Agency will be ploughed back to the Federation to further improve/develop their infrastructure.
- Although, milk fat is also important, but in this module it has been excluded. Managing shortage of fat is less difficult compared to solid-not-fat (SNF). Instead of full-cream milk (6% fat), the Federation may switch over to milk with lower fat like standardized milk (4.5% fat), cow milk (3.2% fat), toned milk (3% fat) and double toned milk (1.5% fat) and thus ward off the difficult/ deficient period with respect to fat.

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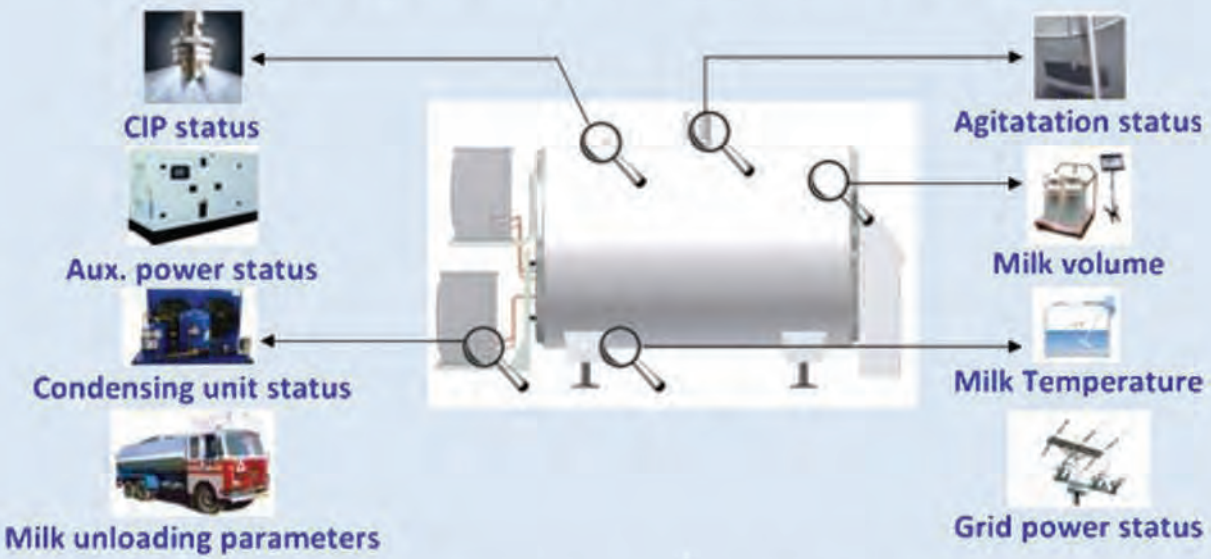

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