

Livestock & Feed Trends



VOLUME - 21 • NUMBER - 2 • JULY - SEPTEMBER 2023



**56th Annual General Meeting (AGM)
&
64th National Symposium 2023**

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From the Chairman's Desk.....

Dear Friends,
Greetings!

At the outset I would like to thank all our members for rendering their support for making our 64th National Symposium a great success. It was well appreciated by all the participants. The Symposium was held during the second quarter (July to September) and CLFMA significantly enhanced its engagement with diverse stakeholders viz Industry, academicians, bureaucrats from the relevant ministries, embassies from different countries etc., with a participation of around 500 numbers.

The 56th Annual General Meeting and 64th National Symposium 2023 was conducted on 18th and 19th August, 2023 at Hotel Le Meridien, Windsor Place Janpath, New Delhi. and an appropriate theme - **"Livestock Sector: Looking beyond the present"** was chosen for the purpose of deliberation.

The most important feature of the symposium this year is that, the Ministry of Fisheries, Animal Husbandry & Dairying and DAHD under the Ministry GOI. extended its logo support and CLFMA wholeheartedly thanked the Government for the same. This year we also had table space for the government which was occupied by the Bureau of Indian Standards, Department of Consumer Affairs, Ministry of Consumer Affairs, Food and Public Distribution, GOI., Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, GOI., Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, GOI.

A detailed **Symposium Report** has been made and the soft copy of the same has been circulated online to all members. The same Report has been presented in the magazine under the Heading 64th National Symposium Report 2023.

I would like to take this opportunity to brief you on CLFMA activities, which have been mentioned under the heading **"CLFMA Activity Updates"** in this magazine. To list a few, CLFMA delegation had a meeting with Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, to extend an invitation for CLFMA's 64th National Symposium on 19th July, 2023. Myself, Dr. Anup Kalra, North Zone President II along with CLFMA Past Chairman, Mr. S. V. Bhawe were present for the meeting. On the same day, the CLFMA delegation had a meeting with Shri. Om Birla, Hon'ble Speaker, Lok Sabha. Myself, CLFMA Hon.



Secretary Mr. Abhay Shah, North Zone President II Dr. Anup Kalra, and CLFMA Past Chairman Mr. S. V. Bhawe were present for the meeting. Myself along with CLFMA South Zone President Mr. R. Ramkutty & CLFMA Managing Committee Member Mr. Jaison John attended S.E. Asia U.S. Agricultural Co-Operators Conference 2023 in Vietnam from September 12 to September 14, 2023.

CLFMA Treasurer Mr. Nissar F. Mohammed was invited by the Consulate General of Malaysia in India to MATRADE (Malaysia External Trade Development Corporation) to meet the Malaysian Prime Minister Mr. Anwar Ibrahim in Kuala Lumpur on 12th September, 2023 for improving bi-lateral trade between India and Malaysia. It is an International Sourcing Programme from 10th to 13th September, 2023.

Your timely words of appreciation, active and wholehearted support, and encouragement from time to time have been a source of inspiration for me to drive CLFMA in the right direction.

We would be grateful for your feedback or input anytime for our improvement.

With warm regards,
For **CLFMA OF INDIA**,

A handwritten signature in blue ink, appearing to read 'Suresh Deora'.

Suresh Deora
Chairman



05CHAIRMAN'S DESK

COMMODITY UPDATES..... 07



20CLFMA UPDATES

SYMPOSIUM REPORT..... 26



85DAIRY

FISHERY..... 93



97GENERAL

CALENDAR OF EVENTS..... 100



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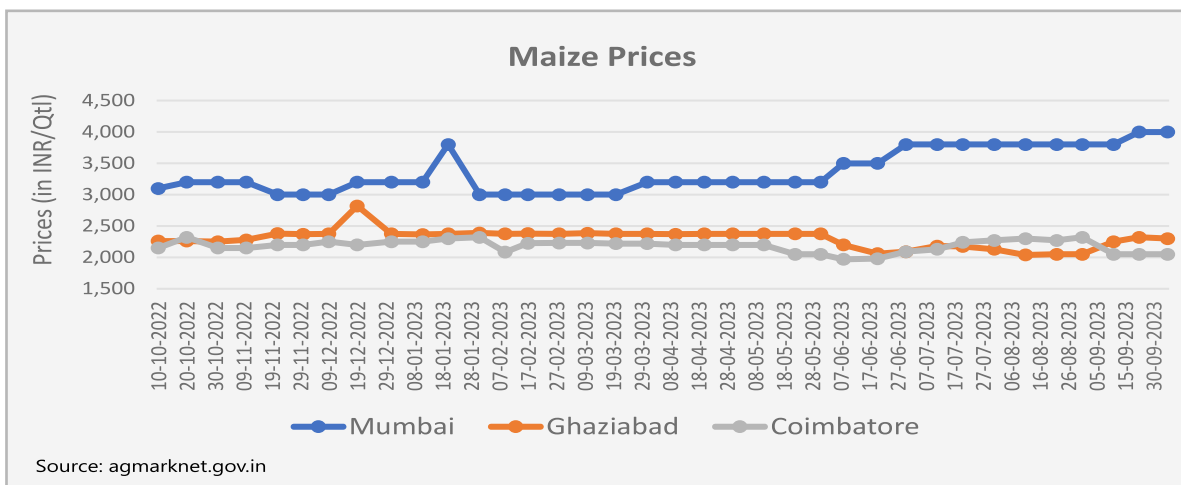
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Commodity Updates

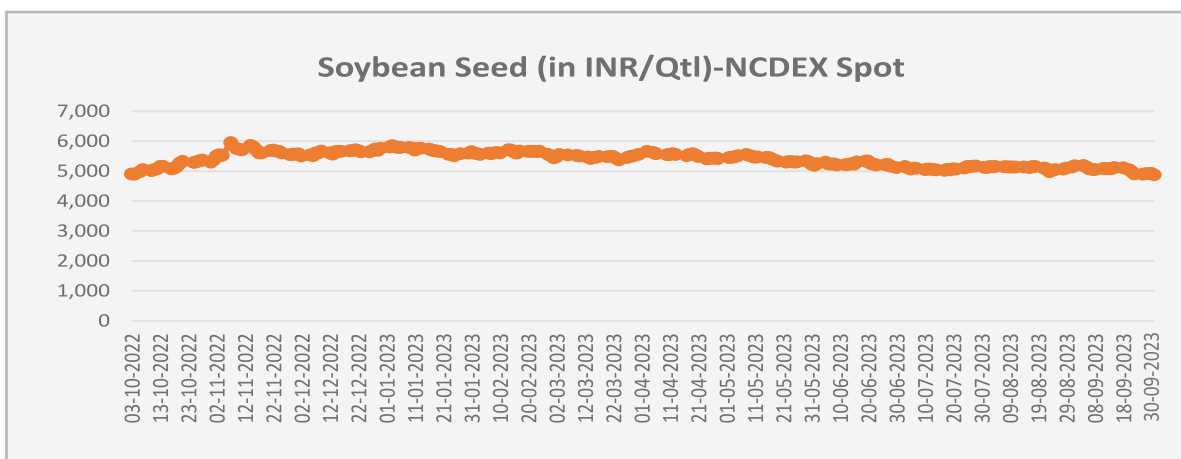
1. Domestic Prices

I. Maize



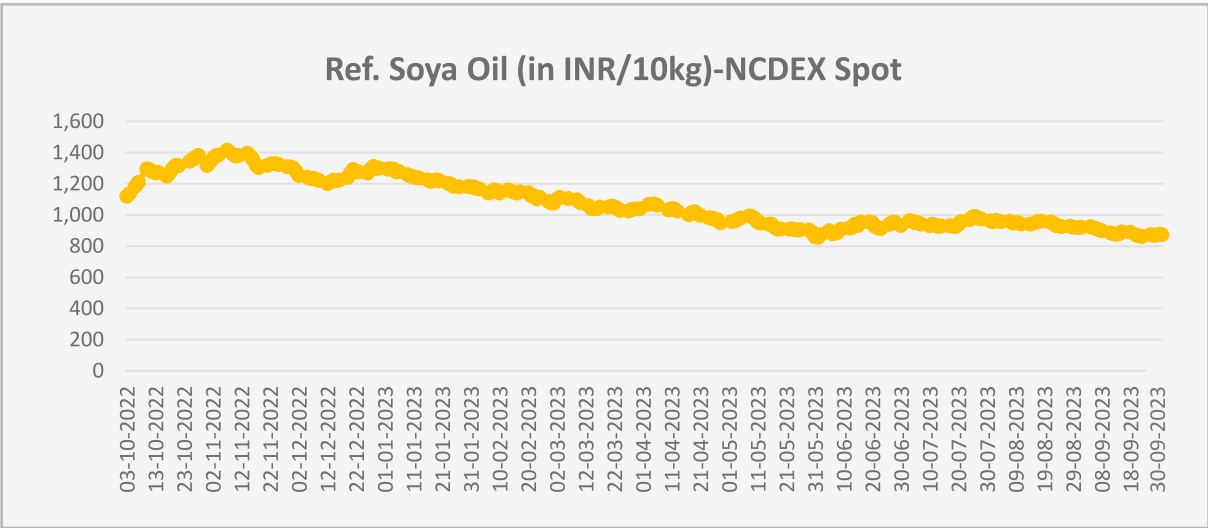
Maize Prices (INR/Quintal)		
City	30/09/2023	31/08/2023
Mumbai	4,000	3,800
Ghaziabad	2,050	2,050
Coimbatore	2,300	2,320

II. Soybean

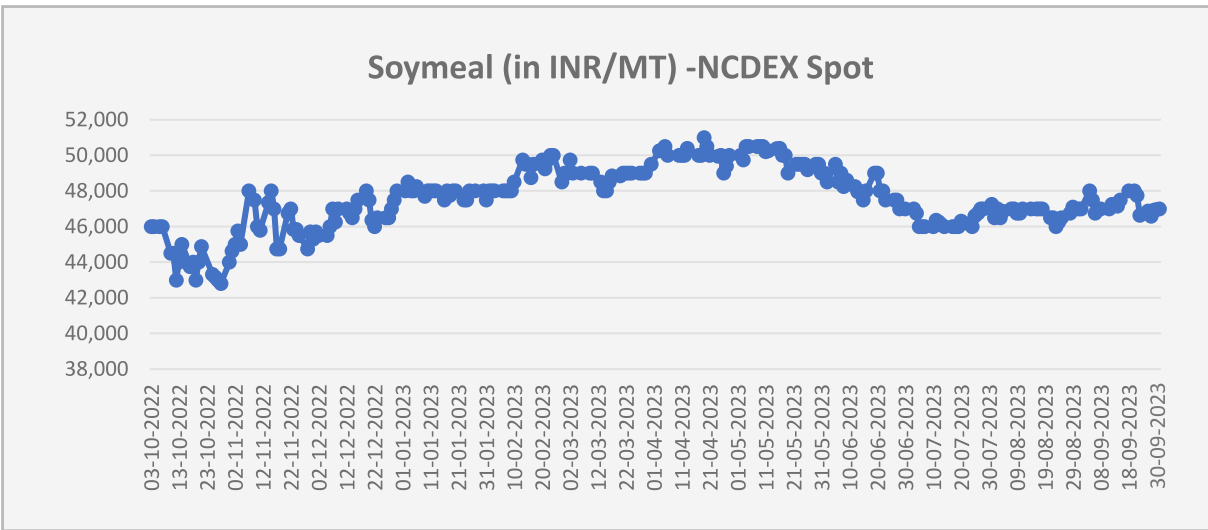


Soybean Complex Prices-NCDEX Spot		
Commodity (Unit)	30/09/2023	31/08/2023
Soybean Seed (in INR/Qtl)	4,878	5,134
Ref. Soya Oil (in INR/10kg)	875	920
Soymeal (in INR/MT)	47,000	47,000

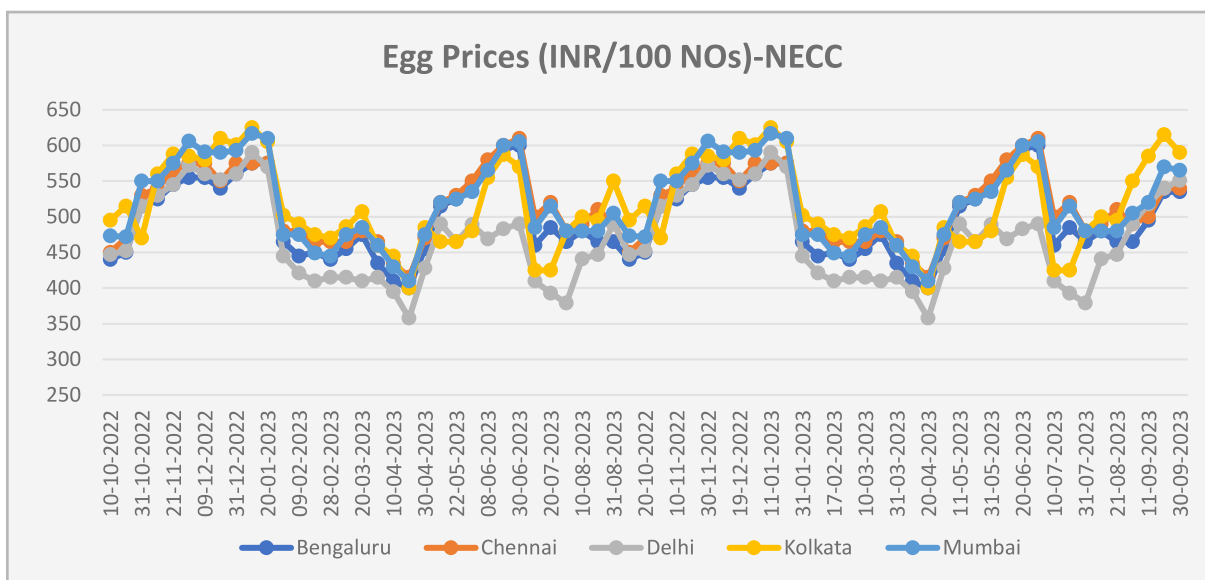
Ref Soya Oil



Soymeal



III. Egg Rates



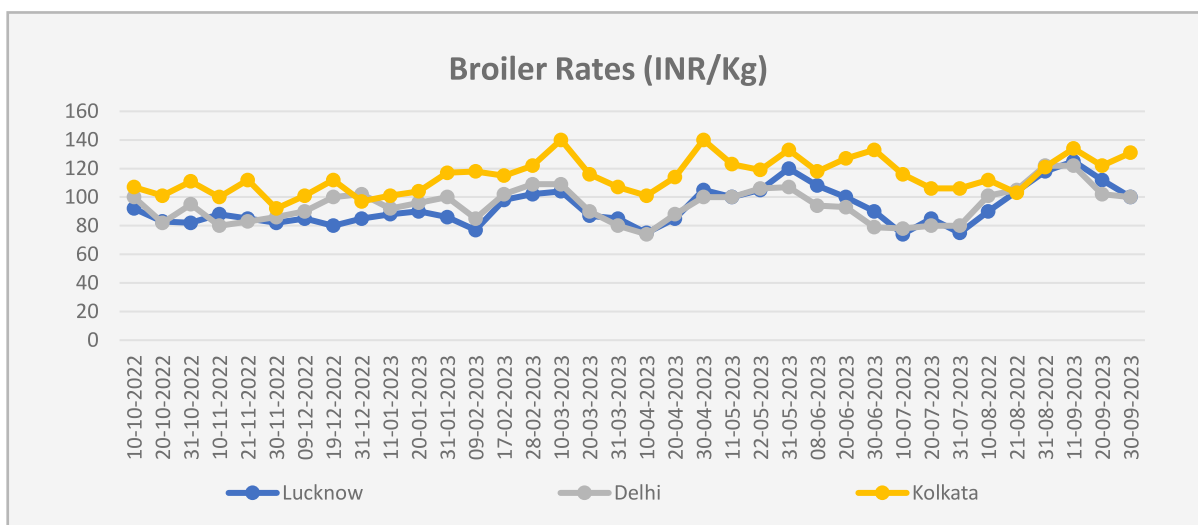
EGG PRICES (INR/100 NOs)		
Name of Zone	30/09/2023	31/08/2023
NECC Prices		
Ahmedabad	555	500
Ajmer	530	475
Barwala	531	472
Bengaluru (CC)	535	465
Brahmapur (OD)	547	497
Chennai (CC)	540	490
Chittoor	533	483
Delhi (CC)	551	490
E.Godavari	525	475
Hospet	495	425
Hyderabad	502	450
Jabalpur	510	463
Kolkata (WB)	590	550
Ludhiana	530	472
Mumbai (CC)	565	505
Mysuru	537	465
Namakkal	490	435
Pune	565	490
Raipur	495	460
Surat	575	505
Vijayawada	525	475
Vizag	533	480
W.Godavari	525	475
Warangal	504	452

III. Egg Rates

EGG PRICES (INR/100 NOs)		
Name of Zone	30/09/2023	31/08/2023
Prevailing Prices		
Allahabad (CC)	557	495
Bhopal	505	475
Indore (CC)	535	475
Kanpur (CC)	557	500
Lucknow (CC)	590	517
Muzaffarpur (CC)	595	537
Nagpur	540	470
Patna	595	537
Ranchi (CC)	581	529
Varanasi (CC)	577	523

Source: NECC

IV. Broiler Rates



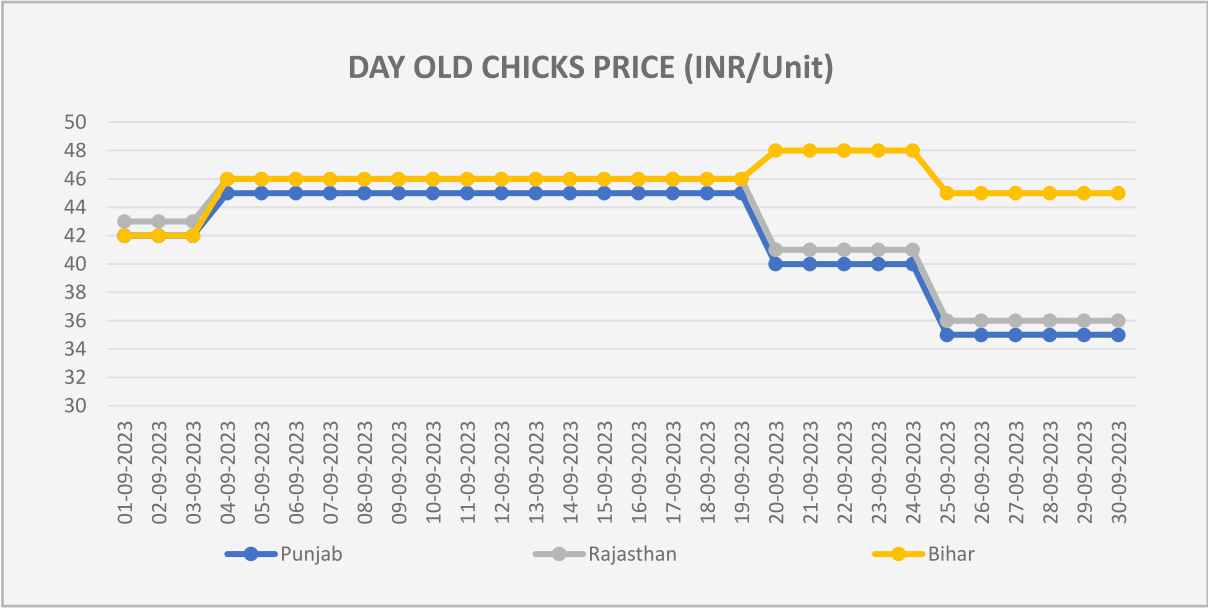
BROILER RATES (INR/Kg)		
Location	30/09/2023	31/08/2023
Delhi	100	122
Punjab	101	135
Raipur	112	108
Pune	111	117
Bengaluru	105	110
Hyderabad	119	129
Guwahati	110	122
Kolkata	131	121
Bihar	115	122
Madhya Pradesh	99	121
Lucknow	100	118

Source: SRP (Wholesale Rates)

V. Day old Chicks Price

DAY OLD CHICKS PRICE (INR/Unit)		
State	30/09/2023	31/08/2023
Punjab	35	42
Dehradun	35	43
Haryana	35	42
Himachal Pradesh	36	43
Rajasthan	36	43
Jammu	36	44
Andhra Pradesh	45	45
Uttar Pradesh	42	42
Madhya Pradesh	41	43
Telangana	45	45
Bihar	45	42
Jharkhand	45	42
Gujarat	42	43

Source: Poultry India TV/ SRP



VI. Fish Prices

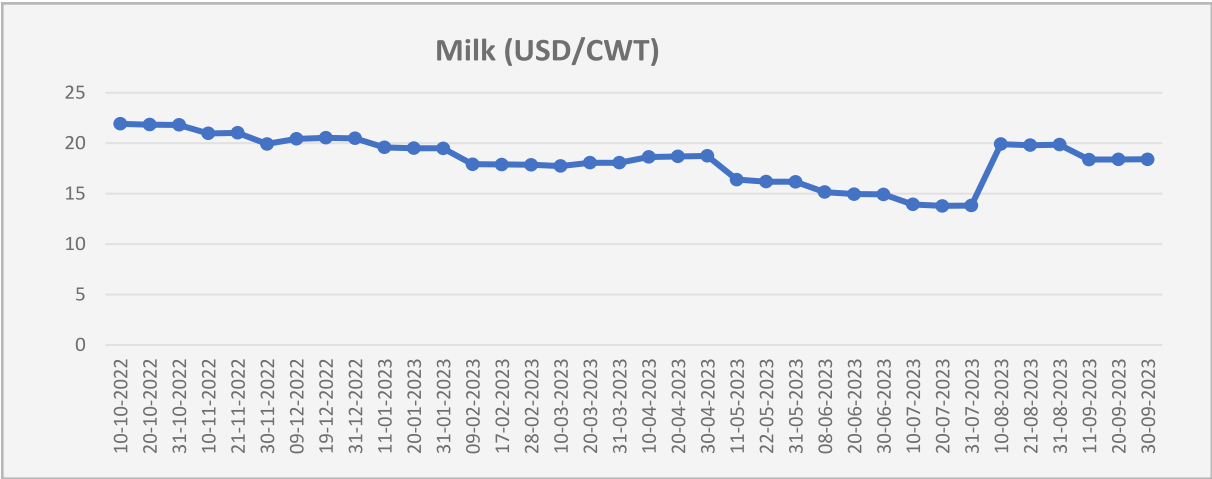
Fish Prices Average Price (INR/Quintal)		
Fish Type	30/09/2023	31/08/2023
Bata Putti	10,000	8,500
Black Dom	13,000	10,000
Blue Dom	14,000	12,000
Chilwa	12,000	8,000
Halwa	29,000	27,000
Hilsa	57,000	58,000
Katla (Small)	12,000	10,000
Malli (Big)	22,000	24,000
Malli (Small)	16,000	18,000
Pangass	6,000	7,000
Katla (Big)	21,000	15,000
Singhra (Big)	24,000	24,000
Singhra (Small)	16,000	16,000
Surmali (Small)	30,000	34,000
Surmai (Big)	42,000	43,000
Sol	30,000	29,000
Soli	21,000	24,000
White Dom	16,000	13,000
Rahu (Andhra)	12,000	11,000
Zinga (Zambo-A)	53,000	50,000
Zinga (Zambo-B)	47,000	43,000
Zinga (Zambo-C)	40,000	38,000

Source: www.kisandeals.com
The Prices are of Delhi (Gazipur Mandi)

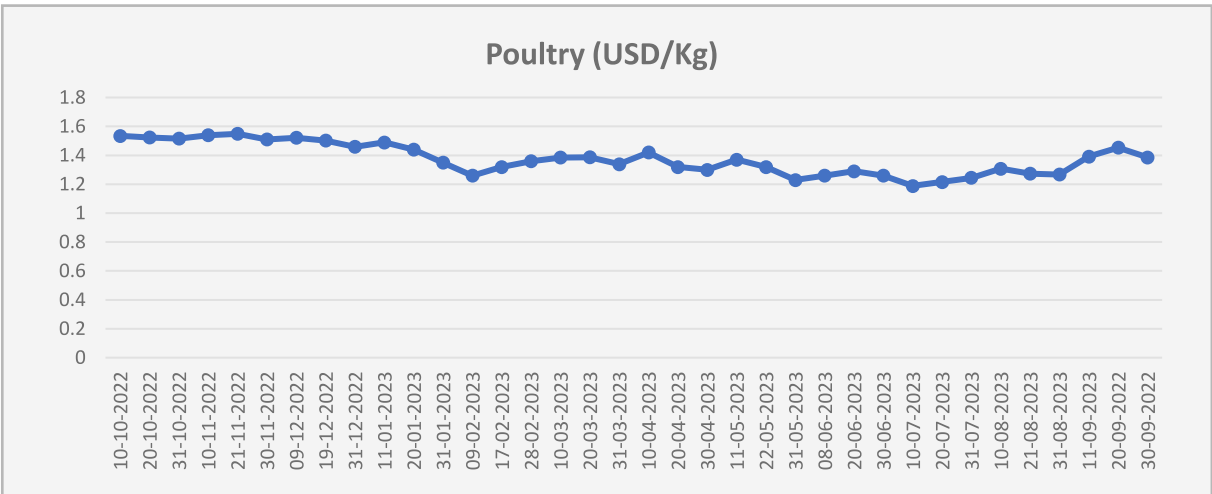
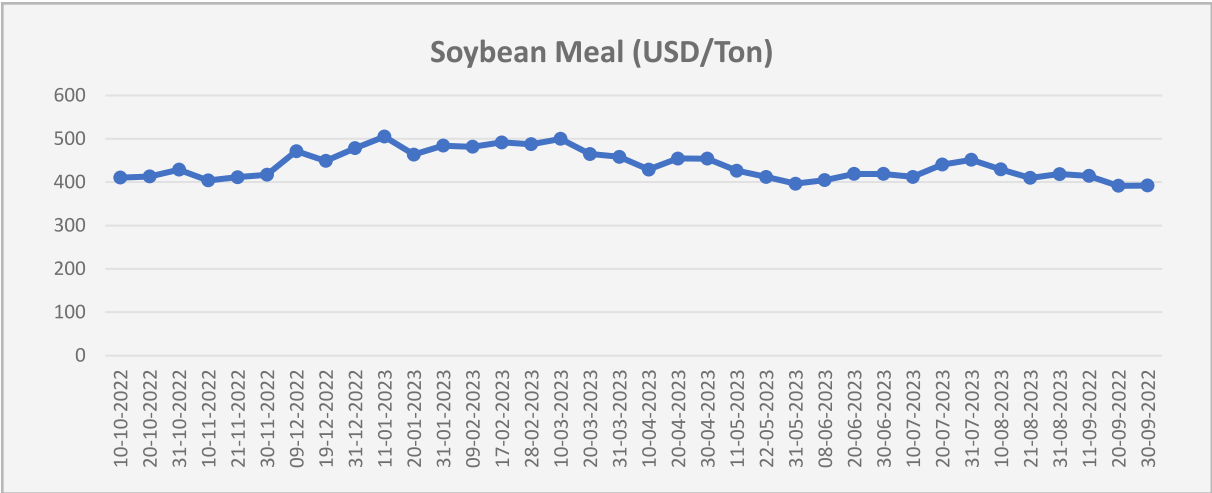
2. Global Commodity Prices

Commodity (Unit)	PRICE (30/09/2023)
Milk (USD/CWT)	18.39
Rapeseed (Euro/Ton)	442.69
Soybean Meal (USD/Ton)	392.40
Soybean Oil (USD/lb)	0.59
Live Cattle (USD/Lbs)	1.86
Poultry (USD/Kgs)*	1.39
Eggs US (USD/Dozen)	1.16

Source: tradingeconomics; markets.businessinsider
USD: United States Dollar
CWT: Short Hundredweight
Lbs: Pounds
1 BRL (Brazilian Real) = 0.20 USD
*-Poultry price refers to the cost of the chicken in the wholesale market of São Paulo, Brazil. The price is converted from BRL to USD using above conversion rate.

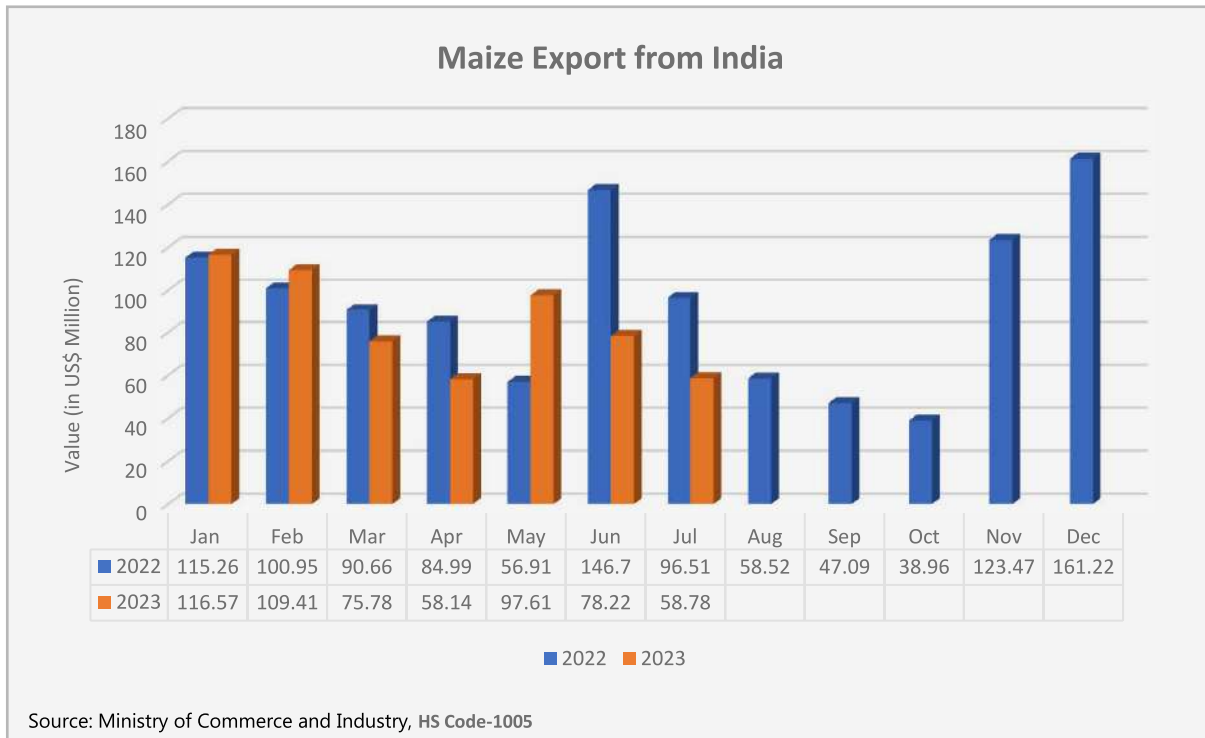


2. Global Commodity Prices



3. Trade Details

India: Maize Export

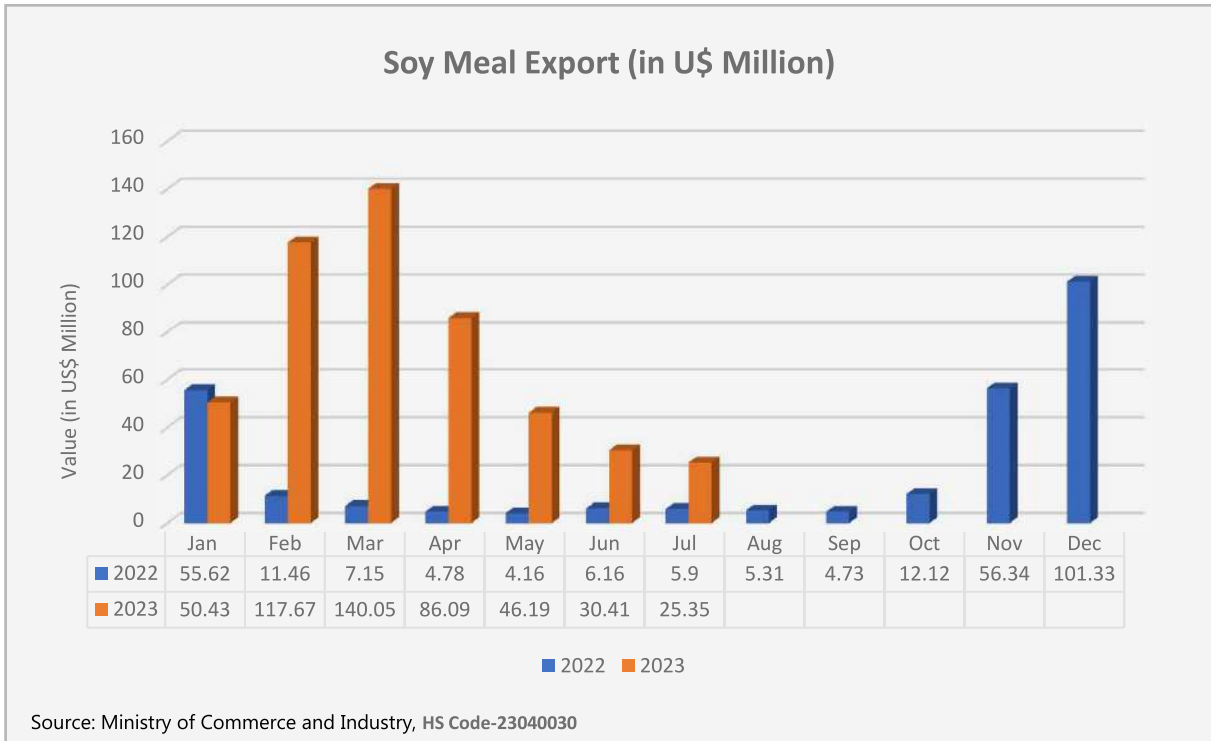


India: Maize Import

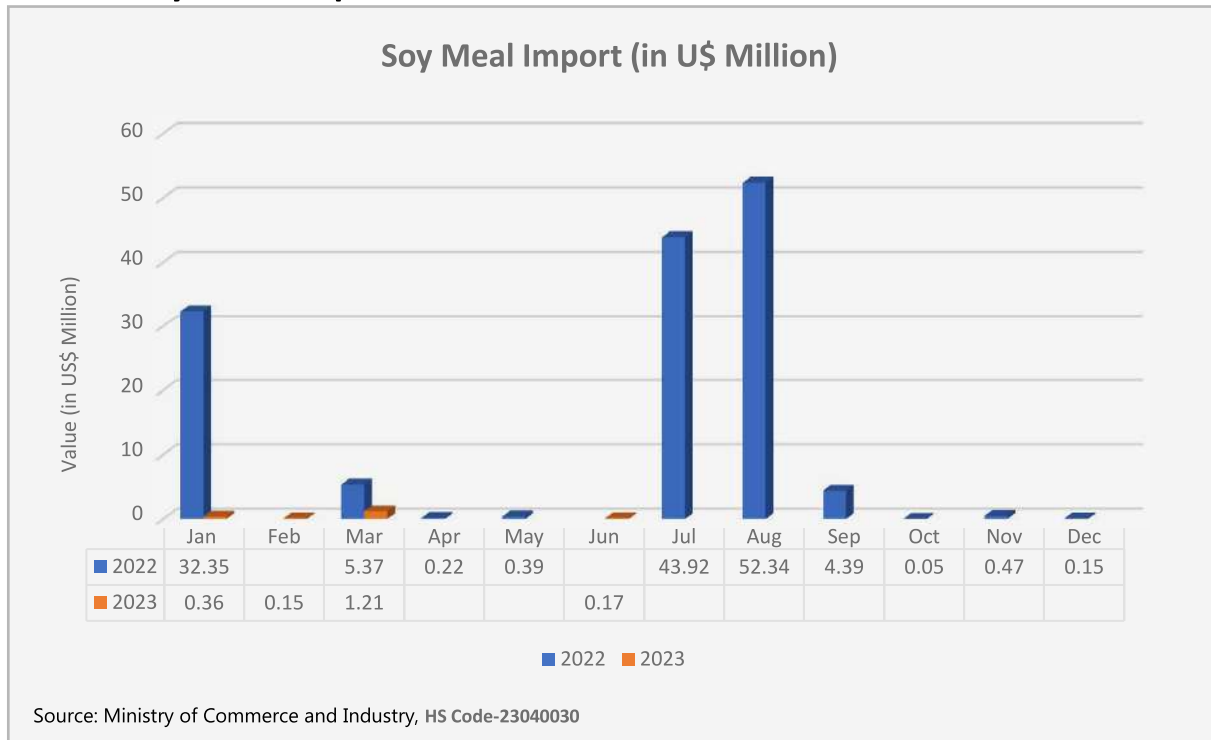


Note: This Data is sourced from the Ministry of Commerce and Industry, which was last updated in July.

India: Soy Meal Export



India: Soy Meal Import



Note: This Data is sourced from the Ministry of Commerce and Industry, which was last updated in July.



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5. Market Drivers

Maize

Market Drivers	Monthly Outlook
Growing Demand for Poultry and Livestock Feed	Bullish
Rising demand for Ethanol in Auto-fuels	Bullish
Increasing Demand as a Wheat Substitute due to Wheat Export Ban	Bullish
Increasing Food Inflation	Bearish
Commercialization of Genetic Modified Maize Crop	Bullish
Increasing demand for Coarse Cereals	Bullish

Poultry

Market Drivers	Monthly Outlook
Rapid Growth in Consumer Demand for Livestock Products	Bullish
Rising Demand for White Feather Broilers	Bullish
Increasing Broiler Chicken Price Increases Due to Higher Feed Cost	Bearish
Increasing Food and Feed Inflation	Bearish
Enhancement of Backyard Poultry Farming	Bullish
Increasing the Demand of Organic Poultry Farming	Bullish

Regards,
CLFMA OF INDIA
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Nariman Point, Mumbai - 400 021, INDIA
Telephone: +91-22-22026103

Sourced by: IMARC Group

CLFMA ACTIVITY UPDATES

Circulation:

FAD5 BIS sent email on 6th July, 2023 on the subject Action arising from 24th meeting of FAD 5 held on 28 Oct 2022. (Reference to the minutes of 24th meeting of FAD 5 held on 28 October 2022). During the meeting the following comments from NDDB, Calf on Doc: FAD 5 (19935) Calcite Powder CaCO₃ - Animal Feed Grade — Specifications were referred to the expert panel for consideration and recommendation in the Panel. The Convenor of the Panel, Dr. Rajesh Sharma, Head (Animal Nutrition), NDDB, who requested to kindly examine the matter in consultation with the members of the Expert Panel and share the recommendation of the Panel to BIS secretariat. CLFMA Forwarded the same to Dr. Prashant Shinde, Managing Committee Member of CLFMA.

Meeting:

CLFMA Representatives attended the Feed quality meeting, which was organized by Maharashtra Government on 7th July, 2023. From CLFMA Dr. Prashant Shinde, CLFMA Managing Committee Member & Dr. Devendra Hooda, North Zone President – 1, & CLFMA Managing Committee Member were present for the said meeting. It was the follow-up meeting with the Animal Husbandry Commissioner, Additional Commissioner, Deputy Director, Mah Representative from (BIS, FSSAI, FDA, PFI), Co-operative Gokul, Representative from Maharashtra Sugrass (Compound Feed Manufacturer by GOM.) Hindustan Feed's, Mr. Nitin Mane, a representative from Godrej, a representative from Maharashtra government Animal Husbandry Lab, and a representative from Shirval Vet College, Maharashtra Dairy Development representative attended the meeting.

The main points of the Conclusion of the Meeting were:

- 1) It is 100% mandatory for all feed Manufacturers to register themselves and should strictly follow BIS guidelines.
- 2) Submission of Samples.

The company can analyze on their own in the approved BIS labs and submit the report to the government or send the samples to the BIS for analysis but the company must pay the cost for analysis.

CLFMA Technical Head Dr. A. S. Ranade attended the Webex Meeting of the BIS Expert Panel on Poultry Feed

and related standards (FAD5/Panel 10) Meeting of 13th July, 2023 at 11:00am.

A stakeholder's consultation meeting convened under the Co-chairmanship of Dr. O.P. Chaudhary, Joint Secretary (NLM), and Shri G.N. Singh, Joint Secretary (Admn, Trade & IC) on 18th July, 2023 at 3:00pm through virtual mode to discuss the following issues;

- 1) Domestic requirements of concentrate/compound animal feed, domestic production, gap, import dependence as well as their exports.
- 2) Domestic requirements of pet food, domestic production, gap, import dependence as well as their exports.
- 3) Average cost of domestic productions as well as average cost of imported concentrate / compound animal feed, pet food, etc.
- 4) Status of duck meat, growth rate and its consumption in the country.
- 5) Any other issues with the permission of the Chairs.

The aforesaid Meeting was attended by Dr. Prashant Shinde, CLFMA Managing Committee Member and Mr. Sandeep Singh, Dy. Chairman of CLFMA OF INDIA.

Representations / Liaisoning with the Government of India:

CLFMA Delegation met government officials on 19.07.2023:

Dr. Anup Kalra, North Zone President II, CLFMA Chairman Mr. Suresh Deora, CLFMA Past Chairman, Mr. S. V. Bhavne met Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying to extend an invitation for CLFMA's 64th National Symposium



On the same day, CLFMA Chairman Mr. Suresh Deora, CLFMA Hon. Secretary, Mr. Abhay Shah, North Zone President II Dr. Anup Kalra, CLFMA Past Chairman, Mr. S. V. Bhawe had a Meeting with Shri. Om Birla, Hon'ble Speaker, Lok Sabha to extend an invitation for CLFMA's 64th National Symposium 2023.



CLFMA Technical Head Dr. A. S. Ranade and Dr. Prashant Shinde attended BIS FAD5 Sectional Committee Meeting on 20th July 2023 at 10:30 am: In the said meeting, Process Reforms in the Standardization Activity of BIS and Future Roadmap were discussed. The Member secretary said that BIS aims to strengthen its standardization activities and ensure that they are aligned with the national priorities and are also more efficient and responsive to the rapidly evolving needs of the stakeholders. The committee members were informed that BIS has developed a Standard National Action Plan 2022-2027, which serves as a roadmap for identifying and prioritizing new areas for standardization.

CLFMA Team visit to Krishi Bhavan on 8th August, 2023

CLFMA Chairman Mr. Suresh Deora along with his team visited Krishi Bhavan on 8th August, 2023 to discuss & finalize the symposium program. He got an appointment of Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Department of AH&D, Ministry of Fisheries, Animal Husbandry and Dairying, and Smt. Alka Upadhyaya, IAS, Secretary AHD, Dept. of AH&D, Ministry of Fisheries, Animal Husbandry and Dairying.

Webinar / Seminar:

CLFMA participated in the SEA – AICOSCA Cottonseed, Oil & Meal Conclave – 2023:

CLFMA participated in the SEA – AICOSCA Cottonseed, Oil & Meal Conclave - 2023 SESSION- VII-Saturday 08.07.2023. Panel Discussion on Cottonseed Meal, Cake & Feed. On behalf of CLFMA Dr. Prashant Shinde, MC Member, Commercial

Director, Cargill India Pvt. Ltd. attended the same as a Panelist.



CLFMA OF INDIA's 56th Annual General Meeting and 64th National Symposium 2023:

CLFMA OF INDIA, an Association of Livestock Industry conducted its 56th Annual General Meeting and 64th National Symposium 2023 on August 18 and 19, 2023 at Hotel Le Meridien, Windsor Place Janpath, New Delhi.

Over 500 participants representing all stakeholders viz. large number of senior officials from the industry, feed manufacturers, aqua & dairy farmers, animal health and nutrition experts, academic institutions, government institutions, ambassador/high commission representatives from various countries, etc. from the sector participated in the 64th National Symposium 2023. The Theme of the event was "Livestock Sector: Looking Beyond the Present" which aimed to build a partnership with the government to take forward the agenda related to the theme. A detailed Symposium Report has been made and the soft copy of the same has been circulated online to all members. The same Report has been presented in the magazine under the Heading 64th National Symposium Report, 2023 from **Page Nos. 26 to 82.**





CLFMA Treasurer Mr. Nissar F. Mohammed was invited by the Consulate General of Malaysia in India to MATRADE (Malaysia External Trade Development Corporation) to meet the Malaysian Prime Minister Mr. Anwar Ibrahim in Kuala Lumpur on 12th September, 2023 for improving bi-lateral trade between India and Malaysia. It is an International Sourcing Programme from 10th to 13th September, 2023.



ASCI's 10th Annual General Meeting:

As CLFMA is the shareholder of ASCI, an invitation for their 10th Annual General Meeting of Agriculture Skill Council of India was sent to CLFMA. ASCI's 10th Annual General Meeting was held on 14th September, 2023 through Video Conferencing/ Other Audio-Visual Means. Ms. Chandrika Venkatesh, Executive Director attended the same.



INFAH's 12th Annual General Meeting:

Mr. Suresh Deora, Chairman, CLFMA & Mr. Divya Kumar Gulati, Dy. Chairman of CLFMA attended the INFAH Annual General Meeting at Hotel West In Garden City, Goregaon West, Mumbai on 23rd September, 2023.

S.E. Asia U.S. Agricultural Co-Operators Conference 2023 in Vietnam:

Mr. Suresh Deora, Chairman of CLFMA along with CLFMA South Zone President Mr. R. Ramkutti & CLFMA Managing Committee Member Mr. Jaison John attended S.E. Asia U.S. Agricultural Co-Operators Conference 2023 in Vietnam from September 12 to September 14, 2023.



PFI's 34th Annual General Meeting:

Mr. Suresh Deora, Chairman, CLFMA attended the Poultry Federation of India's 34th Annual General Meeting dated 27th & 28th September, 2023.



Stakeholder Outreach:

Livestock Expo at India Expo Centre, Greater Noida, UP 3rd to 5th August 2023: CLFMA at Livestock Expo – Greater Noida & Participants from CLFMA team were Mr. Neeraj Kumar Srivastava, Immediate Past Chairman, Dr. Anup Kalra, Zonal President – North II.

CLFMA extended official support to the upcoming 7th edition of the **FEED TECH EXPO** scheduled on 27th -29th October, 2023 at Auto Cluster Exhibition Center, Pune. A half-day conference on **“Evolving feed ingredients: DDGS & Insect Meal”** will also be organized during the event on October 28, 2023 from 14:30 hrs. to 17:00 hrs.

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CLFMA OF INDIA's 56th AGM 2023

The Compound Livestock Feed Manufacturers Association of India's (CLFMA OF INDIA) day 1 featured the 56th Annual General Meeting and the inaugural session of the 64th National Symposium, 2023 at Hotel Le Meridien, Windsor Place Janpath, New Delhi, and an appropriate theme - **“Livestock Sector: Looking beyond the present”** was chosen for the purpose of deliberation.

The 56th Annual General Meeting and 64th National Symposium, 2023 was conducted on 18th and 19th August, 2023 under the Chairmanship of Mr. Suresh Deora.

The Minutes of the Extra Ordinary General Meeting, which was held on Thursday 16th February, 2023 at 11:15 hrs at Hotel Taj Bangalore – Airport, Bangaluru were read by CLFMA Hon. Secretary Mr. Abhay Shah and the same was unanimously approved by all the members present. The annual Report for the financial year 2022-2023 was presented by CLFMA Hon. Secretary Mr. Abhay Shah and the same was approved by all the members present. Treasurer Mr. Nissar F. Mohammed along with Mr. Rohan Dedhia, Chartered Accountant of M/s. Naveen Dedhia & Co., presented the Audited Statement of Accounts and Audit Report for the year ended 31st March, 2023 and the same was approved by all the members present. It was decided during the meeting that M/s Naveen Dedhia & Company, Chartered Accountants will continue to be CLFMA's Auditors for the year 2023-2024. Any other matter was discussed in detail with the permission of the Chair.

64th National Symposium 2023 “Livestock Sector: Looking Beyond the Present”

REPORT : CLFMA OF INDIA conducted the two-day Symposium and has brought about the report consisting of the details of deliberations and outcomes of the Symposium.

Presented by: Suresh Deora, Chairman, CLFMA OF INDIA

CLFMA OF INDIA- ASSOCIATION OF LIVESTOCK INDUSTRY conducted its 56th Annual General Meeting and 64th National Symposium in New Delhi on August 18 and 19, 2023 at Hotel Le Meridien, Windsor Place Janpath, New Delhi.

Over 500 participants representing all stakeholders viz. large number of senior officials from the industry, feed manufacturers, aqua & dairy farmers, animal health and nutrition experts, academic institutions, government institutions, ambassador/high commission representatives from various countries, etc. from the sector participated during the two-day seminar.

The theme of the event was **“Livestock Sector: Looking Beyond the Present”** which aimed to build partnership with the government to take forward the agenda related to the theme. The industry aims to play a constructive and proactive role in implementing the government policies and programs; provide valuable inputs in taking new and innovative policy initiatives; support the ministry in building a strong institutional framework for the sector and above all provide high-quality products and services to the farmers. With a healthy blend of experts from the government and the private sector, the session wise deliberations of the symposium are summarised and are enumerated in this report.

There were two inaugural sessions conducted as the Guest **Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, Government of India** had some other commitments and hence a special session was organized in the morning.

Inaugural Session-I

The Inaugural Session I of the CLFMA of India symposium concluded on a high note on Friday, August 18, 2023. The event, held at Hotel Le Meridien in New Delhi, witnessed the participation of esteemed dignitaries and industry leaders, who shared valuable insights on the future of the animal husbandry, dairying and fisheries, sectors in the country.

The session began with an auspicious lighting of the lamp by esteemed guests, including the prime Guest **Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, Government of India**, and Chairman, Mr. Suresh Deora, Convenor, Mr. Divya Kumar Gulati and Hon. Secretary Mr. Abhay Shah from CLFMA were also present. The chairman felicitated Shri. Parshottam Rupala with a bouquet, shawl, and memento to mark the occasion.

Mr. Divya Kumar Gulati, the convenor of the event, delivered welcome address, setting the tone for an engaging and informative session. This was followed by a thought-provoking address by Mr. Suresh Deora, Chairman of the CLFMA of India, who highlighted the industry's potential and challenges.

The highlight of the event was the prestigious CLFMA Lifetime Achievement Award. It recognized two exemplary individuals for their significant contributions to the livestock industry. The award was announced and presented recognizing their achievements and dedication to the sector. Shri. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA and Chairman & MD of Godrej Industries Ltd. and Shri. Tarun Shridhar, IAS (Retd.). Former Secretary, Animal Husbandry and Dairying, Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India were honoured with the CLFMA Lifetime Achievement Award. The awards were presented by Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry and Dairying, Government of India.

Shri. Nadir B. Godrej thanked CLFMA for the award with full heart and spoke about his journey in the animal feeding business. The glimpses he shared were not only fascinating but inspiring too. Shri. Tarun Shridhar, IAS (Retd.) humbly thanked for the honour and nostalgically remembered how the sector has given him the vast knowledge, experience, insights, and friends he adores today.

The much-awaited Livestock Survey Report (Volume - II) was also launched at the event. Hon'ble minister Shri. Parshottam Rupala, CLFMA Chairman Mr. Suresh Deora, Mr. Nadir B. Godrej, Shri. Tarun Shridhar, CLFMA Dy. Chairman, Mr. Divya Kumar Gulati, and CLFMA Honorary Secretary Mr. Abhay Shah, were present on the dais to unveil the report. The report provides valuable insights into the current state of the livestock sector and outlining future opportunities and challenges. The report is expected to serve as a guiding resource for industry stakeholders, policymakers, and researchers.

Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, Government of India, Shri. Parshottam Rupala, delivered an address at the event. As they say storytelling is the best way to communicate life experiences, our guest shared his life insights with stories of inspiration and success.

He shared valuable insights into government policies and initiatives aimed at promoting the growth and development of the livestock sector. He also highlighted the government's commitment to the development and growth of the fisheries, animal husbandry, and dairying sectors in the country.

Hon'ble minister emphasised that the "Livestock holds an ancient tradition that connects us to our roots. Before we became an agricultural nation, we were herders, showing the deep-rooted connection we have with animals. Animals once relied solely on nature for their sustenance, grazing from morning till afternoon, trusting in their fate. But with amendments in animal feeding practices, we have become the top milk producer in the world contributing 24% of global milk production, emphasizing the importance of conscientious farming."

Although he raised concerns that "Livestock farmers are currently facing challenges with fodder availability. This affects health of animals which directly impacts the income of cattle herders. So, the industry needs to address this issue on a large scale along with the need for proper care and attention of livestock." He added "The government's efforts to merge technology with livestock are commendable. The introduction of vaccination and mobile veterinary units revolutionized the care of livestock."

Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, Government of India, is very hopeful for

the fisheries sector as well. In his speech he brought everyone's attention to inspiring numbers. "India has tremendous potential to lead the world in the fisheries sector. From a mere Rs 3680 crore expenditure from independence till 2014, to a 20,000 crore Pradhan Mantri Matsya Sampada Yojana today, the transformation in fisheries sector is astounding. With the volume of aquaculture soaring from 30,000 crore in 2014 to 63,000 crore today, the potential to lead the world in this sector is within our grasp. Together, let us unlock the immense potential within our communities, industries, and government to become global leaders in fisheries."

Pointers of Guest Address by Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, Government of India, Shri. Parshottam Rupala:

- "The theme of this National Symposium 2023 is very important and meaningful."
- "Animals used to graze based on nature, and farmers had the duty of herding them from morning till noon. Animals used to receive food based on their destiny."
- "Improvements were made in feeding animals so that we could produce more milk. We are the number one milk producer."
- "There is a need to work towards organic farming."
- "Vaccination of livestock has been carried out, and a mobile veterinary unit has been set up."
- "The government is working towards integrating technology with livestock."
- "Animal husbandry can be practiced in any part of the country."
- "Livestock can assist farmers in increasing their income and remaining engaged in farming activities."
- "From 1947 to 2014, the total expenditure on fisheries was Rs 3680 crore, and now it is a separate ministry. The Prime Minister's Fisheries Resources Scheme is worth 20,000 crores. This step helped increase the volume of aquaculture from 30,000 crore in 2014 to 63,000 crore today."
- "If the fisheries community, industries, and government work together, we have the ability to lead the world in the fisheries sector."
- "Before becoming an agrarian nation, we were livestock keepers. Lord Shri Krishna introduced the cow economy. Currently, our livestock keepers face challenges with regards to fodder and feed. The industry needs to work on a new scale. We need to find a solution for the integration of straw and fodder. This is where the industry needs to focus its efforts. The health of livestock is also a concern as it affects the income of livestock keepers."
- "The establishment of a Cooperative department is an important step by the Indian government. Cooperative is ingrained in the DNA of our country. Cooperatives have inherent capabilities to function. The Bal Gopal Bank was initiated, where children become members at the age of 8 and receive money when they turn 18. We provide piggy banks to children, and they deposit money received from relatives. It is at this age that children develop the habit of saving. The Bal Gopal Bank has accumulated 16 crore rupees. The children have become self-reliant."
- "CLFMA has 250 families/Member companies/business under leadership of the Chairman, Mr. Suresh Deora. The minister advised to make an effort to move in one direction under the leadership of the head, and to solve all the problems."

The session concluded with a vote of thanks delivered by Mr. Abhay Shah, Honorary Secretary of the CLFMA of India, expressing gratitude to all the distinguished guests, esteemed speakers, sponsors, delegates, and participants for their valuable contributions and making the inaugural session a resounding success. This was followed by a networking lunch.

The CLFMA of India conference had set a strong foundation for the subsequent sessions, and discussions that would take place over the following days. With the enthusiastic participation of industry experts, policymakers, and stakeholders, the symposium aimed to explore strategies and solutions for the sustainable growth of the fisheries, animal husbandry, and

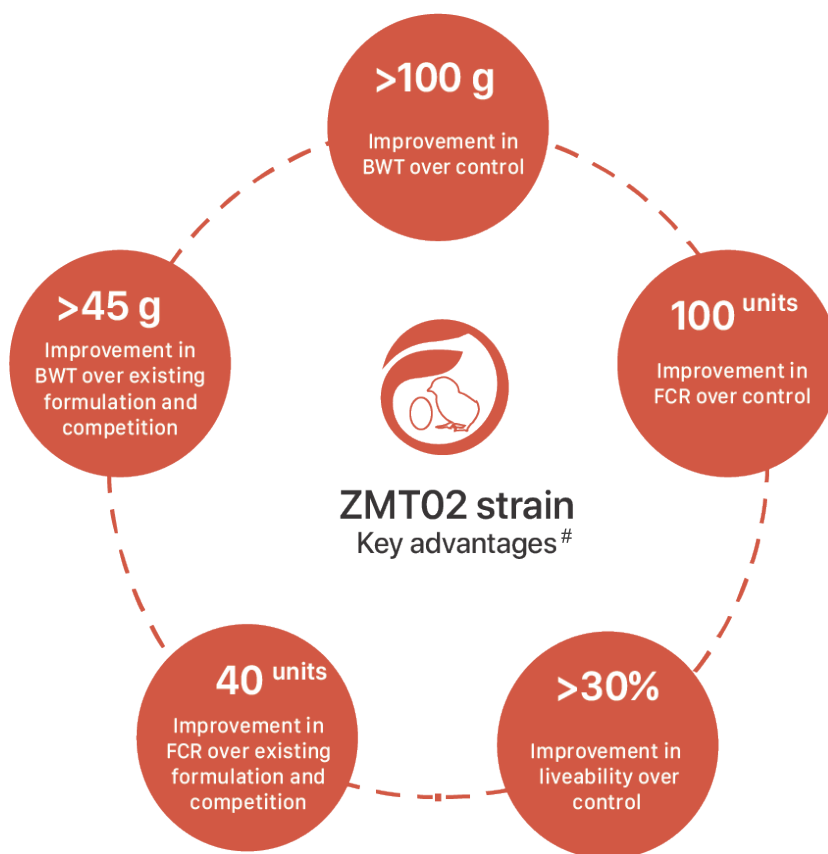


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dairying sectors, contributing to the overall development of the country.

Inaugural Session-II

CLFMA concluded its highly anticipated Inaugural Session - II event, marking a significant milestone in the organization's journey on Day 1 of 64th National Symposium 2023. The event was held at Hotel Le Meridien in New Delhi. The event witnessed the presence of esteemed dignitaries from the government, industry leaders, and key stakeholders. The event centred on the same theme and aimed to bring together industry leaders, policymakers, and experts to discuss the future of the livestock sector in India.

The event commenced with the lighting of the lamp ceremony, where all the dignitaries were invited to the dais. **Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India** graced the occasion as the Guest. **Shri. Nadir B Godrej, Past Chairman of CLFMA of India and Chairman & MD of Godrej Industries Ltd.** **Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry & Dairying, Government of India.** From CLFMA, **Chairman Mr. Suresh Deora, Deputy Chairman Mr. Sumit Sureka, Convenor Mr. Divya Kumar Gulati and Hon. Secretary Mr. Abhay Shah** were present on the dais with the guest.

Dr. O. P. Chaudhary was felicitated by Mr. Suresh Deora with a bouquet, shawl, and memento to mark the occasion. Mr. Sumit Sureka, Deputy Chairman, CLFMA felicitated Shri. Nadir B. Godrej and Shri. Tarun Sridhar was felicitated by Mr. Divya Kumar Gulati.

Mr. Divya Kumar Gulati, Deputy Chairman of CLFMA of India, delivered the welcome address, highlighting the importance of the event and expressing gratitude to all participants. Following the welcome address, Mr. Suresh Deora, Chairman of CLFMA of India, addressed the audience.

A key highlight of the event was the CLFMA Audio Visual Presentation which showcased the achievements and initiatives undertaken by CLFMA of India in the past year. The presentation highlighted the organization's efforts in promoting animal health, welfare, and sustainable practices in the livestock sector.

Mr. Nadir B. Godrej, Past Chairman of CLFMA of India, Chairman & MD of Godrej Industries Ltd., and CLFMA Lifetime achievement awardee delivered the keynote address.

For a change this time the keynote address was in the form of a long poem. The poem showcased the glimpses of his journey, discussing serious issues of agriculture, livestock, dairy, poultry, animal feed and fodder; alternate feed, rising prices, challenges faced, factors like environment, economics, carbon footprints, efficiency improvement and our future.

His poetic keynote address gave us a lesson that in the tapestry of agriculture and livestock, we must weave the threads of innovation and sustainability, for only then can we create a future where abundance coexists with harmony, and where the well-being of our planet is nurtured alongside the progress of our industries. His speech focused on the current trends and prospects of the livestock sector, emphasizing the importance of technological advancements and the role of industry stakeholders in driving sustainable growth. -Refer Page No.17 for Poetic Key note Address.

In the 64th National Symposium, CLFMA Lifetime achievement awardee Shri. Tarun Shridhar, IAS (Retd.) shed light on the theme 'Livestock Sector: Looking Beyond the Present' and shared valuable insights. The livestock sector encompasses various aspects such as animal husbandry, fisheries, and aquaculture. This sector has witnessed impressive growth since its establishment.

Pointers of Guest Address by Shri. Tarun Shridhar, IAS (Retd.) Former Secretary AHD, Department of AHD, Ministry of Fisheries, AH&D.

1. "One notable development in this sector occurred in February-March 2019 when the decision was made to separate the Department of Fisheries from the Department of Animal Husbandry. This move recognized the distinct nature and importance of each sub-sector within livestock."
2. "He even emphasized that "It is remarkable that animal husbandry contributes over 30% to the agricultural GDP,

despite receiving less than 5% of total investment in comparison to agriculture." To further emphasize the significance of this sector, the Ministries of Fisheries were separated from Animal Husbandry and Dairy, highlighting the need for dedicated focus and attention. This separation from the agriculture ministry was a significant step towards recognizing the unique challenges and opportunities present in the livestock sector. It also paved the way for targeted investment in terms of both financial resources and appropriate policies."

3. "In his address he remembers, "In fact, the first agenda item discussed in the first cabinet meeting of the new government was a 15,000-crore project aimed at eradicating disease control and improving the food processing system within the livestock sector. This demonstrates the government's commitment to prioritize and support the growth and development of this sector."
4. "Moreover, the livestock sector has proven to be beneficial to our economy, as evident in the export of fish and buffalo meat. These products, derived from livestock, contribute to our nation's economic growth and provide opportunities for international trade."
5. He even foresees "The Livestock sector plays a crucial role in our economy, and it is time we look beyond the present and invest in its growth. With appropriate policies and infrastructure development, this sector has the potential to create entrepreneurship opportunities and contribute significantly to our GDP. Let us encourage our children to consider careers in agriculture, fish farming, and animal husbandry, and pave the way for a sustainable and prosperous future."
6. In conclusion, Shri. Tarun Shridhar's insights highlight the immense potential of the livestock sector and the need to look beyond the present to harness its full capabilities. "CLFMA has the potential to become a powerful advocate for the industry, taking a strong stand and voicing the concerns and aspirations of its members."

The address was followed by the presentation of the prestigious CLFMA Award. The CLFMA Award is a prestigious recognition given to the individuals working in the livestock sector, who have made significant contributions to the industry. This annual award aims to acknowledge the hard work, innovation, and excellence demonstrated by the individuals.

CLFMA award serves as a catalyst for the growth and development of the livestock feed industry. By acknowledging and celebrating excellence, it encourages all the stake holders for higher standards and innovation in their products & services. Ultimately, this benefits not only the Industry but also farmers, consumers, and the entire livestock farming ecosystem.

CLFMA recognized the exemplary contributions of Dr. Anand Kumar Pathak, Senior Assistant Professor (Animal Nutrition) in SKUAST Jammu and Dr. Pankaj Kumar Singh, Professor and Head of Animal Nutrition, Department of Bihar Animal Sciences University, Patna with the prestigious CLFMA Award. The awardees were felicitated by Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Government of India.

The event also saw the launch of the official souvenir, marking a significant milestone in the symposium with key dignitaries Dr. O. P. Chaudhary, Mr. Nadir B. Godrej, Mr. Suresh Deora, Mr. Divya Kumar Gulati, Mr. Sumit Sureka, Mr. Naveen Pasuparthi, Mr. Sandeep Kumar Singh, Mr. Abhay Shah, present on stage. All office bearers were invited on stage to be an auspicious part of the prestigious moment.

Dr. O. P. Chaudhary addressed the audience, highlighting the initiatives undertaken by the Department of Animal Husbandry & Dairying to promote the growth of the animal feed industry. He highlighted the government's initiatives and policies to support the livestock sector, encouraging industry players to leverage these opportunities for the sector's growth. He highlighted the following major points in his speech.

1. "The government officials are now realizing that they are facilitators, and it is their responsibility to come upfront to guide and help people in the animal feed industry. This includes making policies that support the growth and development of the feed industry."
2. "Additionally, there is a need to address the issue of providing nutritious and balanced food to the poor section of the society. By innovating and balancing the feed and fodder, we can reduce the cost and make it accessible to the weaker sections. For those associated with CLFMA, it is important to explore new ways to earn and fulfil their needs. Exporting

to other countries, particularly those that are economically weaker than us, can be a viable option. It is crucial to seek support from the government in this regard. It is also important to focus on increasing the purchasing power of the people and ensuring that the needs of those who do not have sufficient financial resources are also fulfilled. To achieve this, efforts should be made to include the unorganized sector in the organized sector.”

3. “Currently, the capital subsidy in Animal husbandry for structural development fund will see a significant growth with an increase from 3 to 5 percent, making it 15,000 crores to 25,000 crores.”
4. “Overall, there are several opportunities and challenges in the animal feed industry. By working together, government, industry, and stakeholders can create a favourable environment for growth and development.” At the end of his speech, he congratulated all the CLFMA awardees as well.”

As the event ended, Mr. Abhay Shah, Honorary Secretary of CLFMA of India, delivered the vote of thanks, expressing gratitude to all the dignitaries, eminent speakers, participants, sponsors, and organizers who made the event a success. He emphasized the importance of collaboration and knowledge sharing in driving the growth of the livestock sector. The evening was followed by an enjoyable networking dinner and live performances. This provided an opportunity for the participants to unwind, connect with industry peers, and build lasting relationships.

The CLFMA of India is proud to have organized such a successful event, bringing together industry leaders and stakeholders for insightful discussions and networking opportunities. The 64th National Symposium of CLFMA of India proved to be a significant platform for knowledge exchange, discussion, and collaboration in the livestock sector. The event successfully shed light on the challenges and opportunities beyond the present, encouraging stakeholders to work towards a sustainable and prosperous future for the industry.

In addition to its domestic recognition, CLFMA is also acknowledged by international sectors. It is highly regarded by government departments, agricultural universities, veterinary colleges, and national research institutes within India. Furthermore, CLFMA is respected by related industries outside the country.

Day 2 Symposium Proceedings:

The Second day Symposium started with the Welcome Address by Mr. Suresh Deora, Chairman, CLFMA OF INDIA.

Session-1 :

The First Session was titled **“Graduating from Quantity to Quality: Making Our Agriculture, Livestock and Fishery Globally Competitive”**

Moderator: Mr. Balram Singh Yadav, Past Chairman, CLFMA OF INDIA

Speakers / Panelists:

Smt. Alka Upadhyaya, IAS, Secretary AHD, Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Shri Rajesh Kumar Singh, IAS, Secretary, Department for Promotion of Industry, and Internal Trade (DPIIT), Government of India.

Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry & Dairying, Government of India.

Session Highlights:

The second day of the symposium commenced with registration, followed by a warm welcome address from Mr. Suresh Deora, Chairman of CLFMA of India. He expressed his gratitude for the participation and emphasized the importance of the livestock sector in contributing to India's economy.

Mr. Sandeep Kumar Singh, Deputy Chairman of CLFMA of India, then took the stage to introduce the symposium and invited the distinguished panelists. Mr. B. S. Yadav, Smt. Alka Upadhyaya, Shri. Rajesh Kumar Singh, and Shri. Tarun Shridhar. All the esteemed guests were presented with the bouquet, shawl, and memento.

Smt. Alka Upadhyaya, IAS, Secretary AHD, Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Smt. Alka Upadhyaya, highlighted the importance of continued support and investment in the animal husbandry sector. The extension of the Animal Infrastructure Development Fund and the focus on enhancing existing infrastructure are positive steps towards its growth. The government recognizes the role of private players in driving progress in the sector, as seen in the pharmaceutical industry. However, the budget allocated for animal husbandry is still insufficient, and there is a need for the private sector to open-up capital investment as well. While India has achieved significant milestones as the largest exporter of shrimps and dairy, there is still much more to be done. The animal health department needs improvement, and cooperative growth should be encouraged to ensure the inclusion of small and marginal farmers. Creating an enabling environment and stabilizing prices are crucial for the sector's continued growth and development.

Pointers:

1. "The extension of the Animal infrastructure development fund is a supportive step towards the growth of the animal husbandry sector."
2. "The government is not in favour of entering new institutions, but rather focuses on enhancing existing infrastructure."
3. "There has been a paradigm shift in the approach towards poverty eradication, now focusing on incentive formation."
4. "The growth story in the pharma sector has been written by private players."
5. "The budget allocated for animal husbandry is insufficient considering the sector's potential for growth."
6. "The capacity of the sector to absorb funds is limited, highlighting the need for efficient utilization."
7. "The PM Sampada Yojana has injected a total of 35000 crores into the animal husbandry sector, boosting its growth."
8. "India is the largest exporter of shrimps and dairy products, showcasing its potential in the global market."
9. "While progress has been made, there is still a lot more that needs to be done in the animal husbandry sector."
10. "We need to invest in improving the animal health department to ensure the well-being of our livestock."
11. "Private players will not invest in a failing industry; therefore, the government must provide a stable and supportive environment."
12. "The Animal infrastructure development fund has witnessed tremendous growth, with investments ranging from 5 lakh to 700 crore."
13. "Ground verification has shown that the funds given to the private sector have been utilized effectively, contributing to the sector's progress."
14. "We need to encourage cooperative growth in the animal husbandry sector to ensure the inclusion of small and marginal farmers."
15. "Creating an enabling environment is crucial, and the government is committed to providing support and resources for the growth of the animal husbandry sector."
16. "We have witnessed a significant inflation rate of 62% in the sector, indicating the need for measures to stabilize prices and ensure affordability for consumers."
17. "Duck meat production has seen a substantial increase, thanks to the efforts of a few families. However, there is still room for small and marginal farmers to participate in this market and balance the production."
18. "It is now the right time to focus on infrastructure development in the sector to support its future growth."
19. "The cooperative sector has greatly benefited from the initiatives taken by organizations such as APEDA (Agricultural and Processed Food Products Export Development Authority), and their efforts should be appreciated."

20. "The shrimp industry has been successful, but it is important to recognize that other countries are also entering this market and competition is increasing".
21. "Dairy products may not be highly traded commodities globally, but certain forms of dairy can still be traded at high levels."
22. "Being globally competitive means that your product is in high demand, rather than simply capturing a large market share."
23. "The focus should be on producing high-quality products, rather than solely focusing on quantity or numbers."
24. "The livestock sector should be referred to as the food production sector, highlighting its importance in supplying food to the population."

Shri. Rajesh Kumar Singh, IAS, Secretary, Department for Promotion of Industry, and Internal Trade (DPIIT), Government of India.

"India's agriculture sector, including exports and imports, surpasses even the likes of electronics and mobiles. The pharmaceutical and food processing industries have witnessed remarkable progress and are thriving across the nation. Let us not overlook the advantage of our robust Public-Private Partnership. The PM Sampada yojana has proved to be effective in boosting exports. However, we must address the challenges that hinder higher-level exports and prioritize the formalization of the livestock sector. While the dairy industry has made significant strides in formalization, there is still room for improvement in the meat sector. The government's initiatives in the livestock sector have garnered appreciation, and we have the capacity to produce enough to meet export demands while ensuring compliance with sanitary standards."

Pointers

1. "Agriculture exports and imports are higher than even most commodities like electronics and mobiles".
2. "The agriculture and horticulture sector contribute to 2% of India's economy, more than any other commodity".
3. "The livestock section shows a higher growth rate compared to other sectors".
4. "The pharmaceutical and food processing sectors have shown significant progress and are spread all over the country".
5. "India has a good Potential Livestock Area (PLA) that can be utilized for further growth".
6. "The PM Sampada yojana provides a large subsidy of 30-35%, which is higher than any other government scheme".
7. "The main obstacle to achieving higher export levels is the quality, productivity, and standards of agricultural products".
8. "Recent success has been seen in the poultry sector".
9. "India has high growth potential and is predicted to become the third-largest economy in the world in the next 10 years".
10. "The national government is heavily investing in both physical and digital infrastructure for the agriculture sector".
11. "The livestock sector needs to be formalized to maximize its potential".
12. "The dairy sector is highly formalized, but the meat sector is largely local".
13. "The Hon'ble Prime Minister, Shri. Narendra Modi government's initiatives in the livestock sector have been praised."
14. "India produces enough agricultural products to meet both domestic and export demands, with efforts being made to resolve sanitary issues".

Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry & Dairying, Government of India.

"Productivity and quality are the keys to global competitiveness in the livestock sector. We must replicate the success of the shrimp industry and focus on producing high-quality goods that are in demand worldwide. Let us not just measure our success in numbers or quantity, but in the value, we bring to the market. As the largest and most populous country, we have the potential

to be the biggest market in the world. Let us strive for efficiency and innovation, so that our farmers can reap the rewards of their hard work and investment. Together, we can create a sustainable and prosperous future for the food production sector.”

Pointers:

1. “The shrimp model is being successfully replicated”.
2. “Dairy products have limited trading potential compared to other commodities”.
3. “Being globally competitive means having a product in high demand, not necessarily having a large market share”.
4. “While the shrimp industry has experienced growth, there are now many competitors in the market”.
5. “It is important to focus on producing high-quality products, rather than solely focusing on quantity”.
6. “The livestock sector should be recognized as a significant contributor to food production”.
7. “Farmers can track the productivity of cows by monitoring the amount of milk produced and its sale value”.
8. “The productivity of farmers in terms of fish production is significantly lower than in Norway”.
9. “In terms of productivity, we have the lowest output compared to other countries”.
10. “Despite being the most populous country, we also have the largest market potential”.

Session-2

The Second Session was titled “**Challenges of Feed Security: Bridging the Demand and Supply Gap.**”

Moderator: Mr. Neeraj Kumar Srivastava, Immediate Past Chairman, CLFMA OF INDIA

Speakers / Panelists:

Shri. G. N. Singh, Joint Secretary (Admin/Trade/GC/IC/IT), Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Dr. Praveen Malik, Chief Executive Officer, Agrinnovate India Ltd., (A Government of India Enterprise), New Delhi.

Mr. Naveen Pasuparthi, Deputy Chairman, CLFMA of India.

Dr. Sandeep Karkhanis, Member, CLFMA of India.

Session Highlights:

Mr. Sandeep Kumar Singh, Deputy Chairman, CLFMA OF INDIA, started the session by inviting the panelists and moderator on the stage. Bouquets, Shawls, and Mementos were presented to Mr. Neeraj Kumar Srivastava, Shri. G. N. Singh, Dr. Praveen Malik, Mr. Naveen Pasuparthi, and Dr. Sandeep Karkhanis as a token of appreciation for their valuable contribution to the symposium.

During the session, the panelists discussed the pressing issues related to feed security in the livestock sector and explored potential strategies to bridge the demand and supply gap. The session provided valuable insights into the challenges faced by the industry and proposed innovative solutions to ensure a sustainable and efficient feed supply chain for the livestock sector.

Shri. G. N. Singh, Joint Secretary (Admin/Trade/GC/IC/IT), Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Shri. G. N. Singh, suggested innovative steps to bridge the gap and create a level playing field for the producers.

He emphasized that we need to ensure our production practices are environmentally responsible, considering factors such as land use, waste management, and energy consumption. We also need to reduce our dependence on Imports. While it may be tempting to rely on foreign products to meet our demand, it is not a sustainable solution in the long run. Looking ahead, we also need to be mindful of future challenges. To address these challenges, we must find solutions within our own country. This can be achieved through the establishment of cooperatives, where farmers and producers work together to strengthen the industry. It is crucial to involve all stakeholders and think big in order to overcome these obstacles.”



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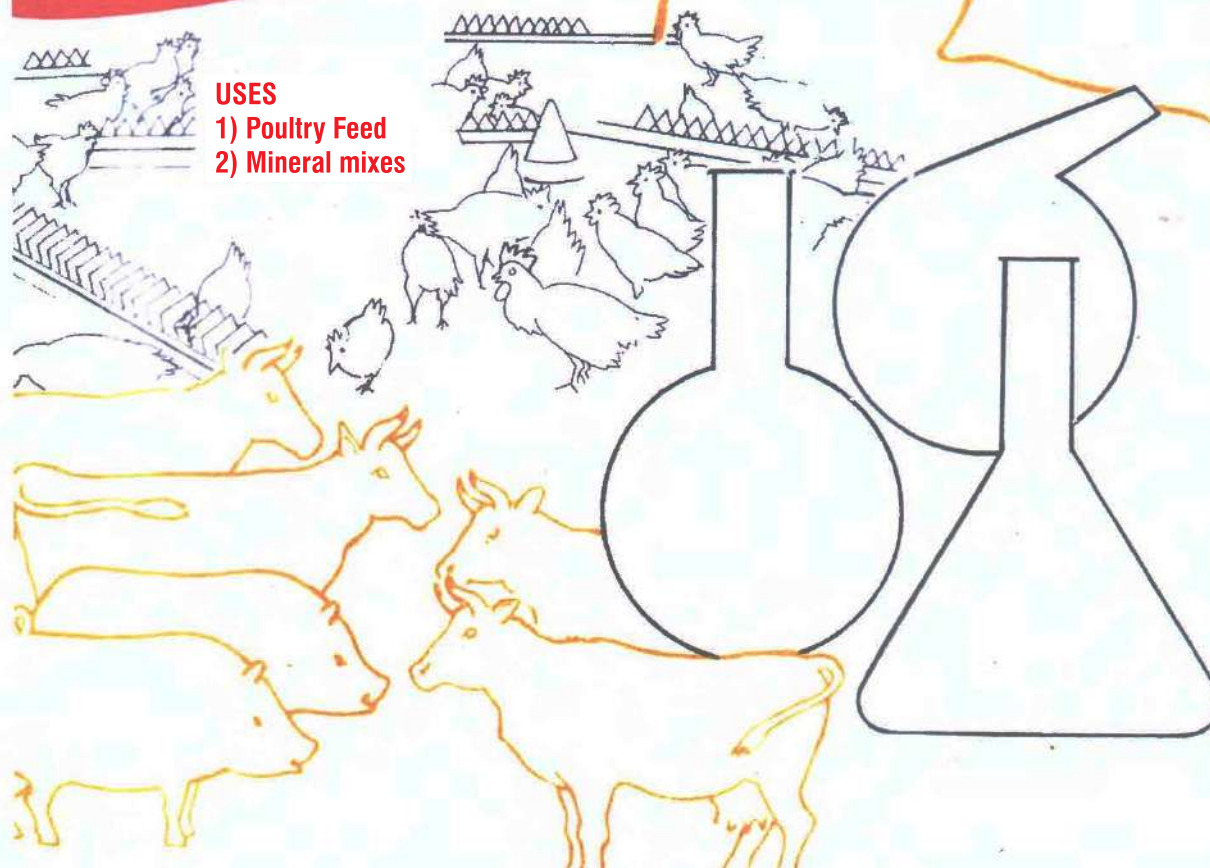
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USES

- 1) Poultry Feed
- 2) Mineral mixes



SPECIFICATIONS

(1) Moisture content	7.0 % Max
(2) Phosphorous as "P"(Total)	16.6-18.3 %
(3) P2O5 (Total)	38-41 %
(4) Calcium as CA	23.0 % Min
(5) Acid insoluble ash	1.0 % Max.
(6) Flourine as F	0.2 % Max.

N.B.: The contents for item (2) to (6) are on moisture-free basis.

Factory : Plot No.1/A, G.I.D.C. Industrial Estate,
National Highway,

VAPI - 396 195. (Gujarat). INDIA

Tel.: 91 - 260 - 240 1584 / 91 - 94299 61759 / 91 - 94298 95136

GSTIN No. 24AAACI3676F1ZQ

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"Furthermore, we need to tap into the vast potential of our domestic market. With a large population and increasing demand, it is essential that we maximize our production capabilities. This includes focusing on the animal compound feed market and ensuring a steady supply of quality ingredients for the feed industry. We must adopt a liberal policy approach. By creating a favourable business environment, we can attract investments and encourage entrepreneurship in the poultry and dairy sectors. This will not only benefit our producers but also contribute to the overall growth and development of our country."

Pointers:

1. "To have sustainable food security, we must prioritize taking care of environmental factors."
2. "There are no alternatives; no other industry can thrive on imports alone."
3. "Technological progress in our area is crucial for the future of our industry."
4. "If we want a self-sufficient poultry industry, we must rely on indigenous production."
5. "By 2030-2040, China will be entering the markets of soya milk, creating competition."
6. "We have competitive demands and must address technical and environmental issues."
7. "Genetically modified organisms (GMOs) may have sustainability issues, as seen in Brazil and Latin America countries."
8. "China is already reorienting its policies, making it a competitor in our market."
9. "We need to find solutions within our own country."
10. "Cooperatives can be a viable option for farmers and producers."
11. "Think big and embrace this challenge."
12. "There is no other way out; we must find a balance for the domestic market's demands."
13. "The animal compound feed market and feed industry ingredients are essential considerations."
14. "We must work with the legacy we have and have a liberal policy on this matter."
15. "From a policy perspective, we need to find a balance that is acceptable to all parties involved."
16. "He was optimistic about having a brilliant future for the livestock industry."
17. "We should believe in ourselves and our ability to overcome challenges in a holistic approach."

Dr. Praveen Malik, Chief Executive Officer, Agrinnovate India Ltd., (A Government of India Enterprise), New Delhi

Dr. Praveen Malik, Chief Executive Officer, Agrinnovate India Ltd. emphasised "Technology is the only saviour in mitigating challenges of demand-supply of raw materials. Industry must prioritize R&D and collaborate with the private sector to find innovative solutions. The private sector should actively engage in R&D collaborations to meet industry requirements. They should sponsor research and development activities to apply scientific advancements to their products. It is important for them to also establish links with farmers and other stakeholders involved in the production process."

Pointers:

1. "Emphasise the importance of the R&D sector in driving innovation and growth".
2. "Highlight the myopic approach that the industry currently has and the need to shift focus towards long-term solutions".
3. "Stress the importance of considering R&D in addressing issues such as climate change and alternative protein sources".
4. "Discuss the proposal to back insect protein as a potential solution to the shrinking sources of protein".
5. "Address the interconnectedness of the ethanol and petroleum industry and the need to find sustainable alternatives".
6. "Highlight the shrinking arable land and its impact on the industry, emphasizing the need for R&D in finding solutions".
7. "Discuss the consequences of relying too heavily on imports, which could potentially destroy the domestic market".

8. "Encourage industry participation in R&D collaborations and the sponsorship of R&Ds to translate science into practical products".
9. "Emphasise the need for industry involvement with backward linkages, particularly with farmers, to ensure the sustainability and success of R&D efforts".
10. "Highlight technology as the key to finding solutions and stress the importance of collaborations and partnerships in driving progress".

Mr. Naveen Pasuparthi, Deputy Chairman, CLFMA of India :

Mr. Naveen Pasuparthi, Deputy Chairman, CLFMA of India opines that "Industry must invest in agriculture crop farming to secure our raw materials for the future. We must also prioritize the investment in insect protein, as consumption of traditional products has dropped. It is time for the industry to come together and act, rather than relying on associations or others to do so. Additionally, the government should consider reducing import duties on essential items such as vitamins and amino acids, to encourage growth and competitiveness in the foreign market. We must strive to export more, while also ensuring a sustainable and profitable future for our industry."

Pointers:

1. "Aqua, dairy, and poultry are in the business of cereals, indicating a shift in focus".
2. "The cost of poultry production is expected to exceed 60% of the overall production cost, highlighting its significance".
3. "The consumption of aqua, dairy, and poultry products has declined, suggesting a need for intervention".
4. "Insect protein is seen as a potential investment opportunity for the industry".
5. "The lack of investment by aqua, dairy, and poultry in agriculture crop farming is viewed as a concerning matter".
6. "The industry's failure to directly invest money is seen as a glitch."
7. "The debate surrounding genetically modified organisms (GMOs) is divided among those who oppose and support it".
8. "There is a call for the industry to invest in GMOs".
9. "The industry should invest in increasing the number of agriculture crop farmers to secure future raw materials".

Dr. Sandeep Karkhanis, Member, CLFMA of India:

Dr. Sandeep Karkhanis, said that, "Increasing productivity and finding alternative substrates are essential to bridge the demand-supply gap in ethanol production. We must prioritize cultivating high-yield varieties of maize and explore new products like bajra and sorghum for animal feed. Disease challenges and the availability of raw materials must be closely addressed by law makers and policy makers. Let's aim for an open market approach and promote hygienic poultry practices, ensuring a sustainable and profitable industry."

Pointers:

1. Dr. Sandeep Karkhanis, a member of CLFMA of India, discusses the availability of raw materials for ethanol production.
2. The use of maize as a substrate for ethanol production is highlighted as a major source.
3. The issue of ethanol production is discussed, and ways to mitigate the problem are explored.
4. The current petrol requirement in India is stated to be 3.5 billion litres per year.
5. The Prime Minister envisions the use of 20% ethanol blended petrol in the country.
6. The need for 700 million metric tonnes of ethanol is emphasized.
7. Meeting this demand is possible, but there is a significant gap in productivity that needs to be addressed.
8. Cultivating high-yield varieties of maize is suggested as a solution.

9. The possibility of shifting focus from ethanol production to other products, such as bajra and sorghum, for animal feed is explored.
10. The importance of disease control in the poultry industry is highlighted, and the need for lawmakers and policy makers to address this issue is stressed.

Session-3

The Third Session was titled "**Development Initiative and Regulatory Framework**,"

Moderator: Mr. Sandeep Kumar Singh, Deputy Chairman, CLFMA OF INDIA

Speakers / Panelists:

Dr. Sujit K. Dutta, Joint Commissioner (AH), Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Dr. Gagan Garg, Deputy Commissioner (Trade), Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Smt. Suneeti Toteja, Scientist - E, Bureau of Indian Standards (BIS), Government of India.

Dr. Monica Puniya, Deputy Director, Food Safety and Standards Authority of India (FSSAI), Government of India.

Dr. Prashant Shinde, Managing Committee Member, CLFMA OF INDIA.

Mr. Suresh Rayudu Chitturi, Member, CLFMA OF INDIA.

Session Highlights:

The session commenced with Mr. Divya Kumar Gulati, inviting the moderator, Mr. Sandeep Kumar Singh and the panelists Dr. Sujit K. Dutta, Dr. Gagan Garg, Smt. Suneeti Toteja, Dr. Monica Puniya, Dr. Prashant Shinde, and Mr. Suresh Rayudu Chitturi on the stage.

The session commenced with the esteemed panelists sharing their insights and expertise on the subject matter, providing valuable information to the attendees.

With such a diverse and knowledgeable group of panelists, the audience eagerly waited to hear their experiences and insights on the topic of Development Initiative and Regulatory Framework.

The moderator, Mr. Sandeep Kumar Singh, began the session by setting the context and highlighting the importance of development initiatives and a robust regulatory framework in the animal husbandry and dairy industry. Each panelist then took turns sharing their expertise on different aspects of the topic.

Dr. Sujit K. Dutta, Joint Commissioner (AH), Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Dr. Sujit K Dutta said "Standards should be made mandatory. Industry collaboration and data-driven standards are the key to ensuring effective and implementable solutions. Government should empower industries to drive the standards, as they are the ultimate buyers of these regulations."

Pointers:

1. "Standards should never be optional; they should be a mandatory requirement for every industry."
2. "The collaboration between industry and standards organizations is crucial for developing effective and relevant benchmarks."
3. "Industry data provides valuable insights and should be the driving force behind the formulation of standards."
4. "Standards are a product that industry purchases, not the government. Therefore, industry involvement is essential in the standard-making process."

5. "The success of any standard ultimately lies in the hands of the industry, as they are the ones responsible for implementation."
6. "Government should prioritize facilitating industry standards in poultry rather than creating their own."
7. "To ensure comprehensive and effective standards, industry experts should have more significant input in the development process."
8. "Close collaboration between industry leaders and standard-making bodies is essential to create standards that truly meet industry needs."
9. "Data collection, validation, and collaboration are key steps in the development of practical and useful standards."
10. "Standards must always be realistic and implementable; otherwise, they lose their purpose and value."

Dr. Gagan Garg, Deputy Commissioner (Trade), Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

Dr. Gagan Garg shed light on the topic of the session saying "Regulating the import and export of animal feed is crucial. and to make standards, a clear draft of specific requirements is necessary within the industry. You are expected to present a draft document that clearly outlines what you need. This draft serves as a preliminary outline or blueprint of your expectations or specifications."

Pointers:

1. "Import regulations may hinder the free flow of goods, but they also ensure safety and quality standards are met."
2. "Exporting countries seek national treatment to ensure fairness and equal opportunities in international trade."
3. "Animal feed is not merely a single ingredient, but a carefully crafted mixture to provide optimal nutrition."
4. "In the food supplement industry, replication of successful products is often necessary to meet consumer demand."
5. "Drafting a precise outline of requirements is vital within any industry to ensure efficient and accurate production."
6. "Although animal feed is meant for farmers, it's crucial to address the challenges of limited livestock availability."

Smt. Suneeti Toteja, Scientist - E, Bureau of Indian Standards (BIS), Government of India.

Smt. Suneeti Toteja shared insights from the Bureau of Indian Standards (BIS) and its efforts to develop and implement quality standards for animal products. She emphasized the role of standards in ensuring product safety, consumer trust, and market competitiveness. She raised a crucial aspect of involving stakeholders and representatives from consumer bodies and the government sector in our national level technical committees. By doing so, we can ensure that our decision-making processes are inclusive and consider a wider perspective.

Pointers:

1. "Collaboration between BIS and FSSAI is essential for standardization and certification in the food industry."
2. "Representation from consumer bodies and the government sector is crucial in setting national standards on a wider perspective."
3. "Consensus is the key to making decisions that are beneficial for all stakeholders."
4. "The Animal Feeds and Nutrition sectional committee plays a vital role in analyzing the quality of animal feeds."
5. "Indian standards on compound cattle feeds are comprehensive and cover various important requirements."
6. "Understanding the ingredients of compound cattle feed is essential for ensuring nutritional balance."
7. "Different types of animal feed have specific Indian standards to ensure quality control."
8. "The use of Indian standards ensures the safety and efficiency of animal feed products."

9. "Standardization in the food industry leads to better consumer confidence and quality assurance."
10. "Continuous improvement in standards is necessary to meet the evolving needs of the food industry."

Dr. Monica Puniya, Deputy Director, Food Safety and Standards Authority of India (FSSAI), Government of India.

Dr. Monica Puniya discussed the role of the Food Safety and Standards Authority of India (FSSAI) in regulating and monitoring food safety in the animal husbandry and dairy sector. "Ensuring the safety of animal feed is not just about protecting animals, but also about safeguarding their health. She suggested several rationale for including animal feed in FSS act 2006. By including animal feed in the FSS Act 2006, we aim to improve the quality of raw materials, control manufacturing and distribution, and ultimately, guarantee the safety of our food chain."

Pointers:

1. "FSSAI's role in ensuring safety, extends beyond human consumption, as animal feed regulation is necessary as well."
2. "Animal feed must be included in the FSS Act 2006 to guarantee the well-being of animals and the quality of their feed."
3. "Improving the quality of raw materials in animal feed is crucial for the overall health and safety of animals and the products derived from them."
4. "Effective control measures are needed to oversee the manufacture, sale, and distribution of animal feed, raw materials, and feed additives."
5. "Including animal feed in the FSS Act 2006 offers several logic-driven justifications, as suggested by experts."
6. "Regulating animal feed requires the implementation of standard operating procedures, test methods, and involvement of accredited labs and government officials."
7. "Regular surveillance is necessary to ensure the safety of animal feed, and generate data for risk monitoring and common approval monitoring of labs and feed businesses."

Dr. Prashant Shinde, Managing Committee Member, CLFMA OF INDIA.

Dr. Prashant Shinde said "While the committee formation and the scientific research background are commendable, it is essential that experts with practical industry knowledge are included to ensure the voice of the industry is considered. We are willing to share our data and collaborate for a better outcome."

Pointers:

1. "In the compound feed sector, where efficiency is key, we must strive to find a balance between research and the practical knowledge of industry experts."
2. "A committee formation with a scientific background is commendable, but it is crucial to also give a voice to the industry that drives the sector."
3. "Let's bridge the gap between theory and practice by bringing in practical experts to the committee, ensuring a holistic approach to decision-making in the compound feed sector."
4. "Transparency is essential for progress. We are ready to share our data to contribute to the development of standards in the industry."
5. "Moisture in feed remains a pressing concern, and addressing this issue should be a priority for the committee in charge."
6. "We don't need different opinions; we need a revision of standards that takes into account the practical realities of the compound feed sector."
7. "BIS plays a crucial role in setting standards, and we hope they consider the industry's perspective when revising existing regulations."

Mr. Suresh Rayudu Chitturi, Member, CLFMA OF INDIA.

Mr. Suresh Chitturi expressed his concerns regarding the current state of processing and restrictions in the sector. He emphasized that while processing is a growing industry, it faces numerous challenges that make progress difficult. He pointed out that the focus of vaccines in our country seems to be primarily on one disease. He stressed the need for a more comprehensive approach, with vaccines developed for a wider range of diseases that affect the poultry industry. Without up-to-date vaccines, farmers are left vulnerable to the constant threat of outbreaks, putting their livelihoods at risk.

Pointers:

1. "Processing may be nascent, but with the right conditions, it can overcome any challenges it faces."
2. "Why should poultry be the only industry that faces restrictions? It's time for equal opportunities."
3. "Our country needs to broaden its focus on vaccine development and not just concentrate on one disease."
4. "It's time for our vaccines to catch up with the ever-evolving diseases."
5. "Without proper surveys of poultry diseases, we are walking blindfolded into potential disasters."
6. "The poultry industry needs a helping hand from the government and regulators to address these pressing issues."
7. "As mentioned by an expert, both the South Indian region and the industry are grappling with these challenges."

The session concluded with a vote of thanks from Mr. Divya Kumar Gulati, expressing gratitude to the panelists for their valuable insights and to the attendees for their active participation. The audience left the session with a deeper understanding of the development initiatives and regulatory framework in the industry, and a renewed sense of commitment to driving growth and ensuring quality in the animal husbandry and dairy sector.

A presentation on "Right to Protein" by Mr. Jaison John, CLFMA Managing Committee Member, Team Lead India, U. S. Soyabean Export Council (USSEC) followed the panel discussion.

Pointers:

1. Right To Protein is an awareness campaign to educate people about the importance of adequate protein consumption for better nutrition, health, and wellbeing.
2. The campaign aspires to build public knowledge of different types of protein sources, to meet larger nutritional security goals.
3. It is supported by several like-minded organizations, institutions, academicians, professionals, and individuals. The campaign is exclusively driven by the U.S. Soybean Export Council (USSEC).

For more information, please refer our website www.clfma.org

Valedictory Session:**Symposium Summation & Conclusion :-**

The symposium concluded with the valedictory session delivered by **Mr. S. V. Bhawe, Past Chairman** of the CLFMA of India, who offered a summation of the discussions and key takeaways from the event. The event also included the felicitation of sponsors, media, guests, and invitees.

Take Aways:**1) Inaugural Session-I:-**

Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, Government of India delivered the Guest Address at the event. As they say storytelling is the best way to communicate life experiences, our guest shared his life insights with stories of inspiration and success which has been detailed above in the report under the heading Inaugural Session-I.

2) Inaugural Session-II:-

Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Department of Animal Husbandry & Dairying, Ministry of Fisheries, AH&D, Government of India addressed the audience, highlighting the initiatives undertaken by the Department of Animal Husbandry & Dairying to promote the growth of the animal feed industry. He highlighted the government's initiatives and policies to support the livestock sector, encouraging industry players to leverage these opportunities for the sector's growth and the detailed highlights has been given above in this report under the heading Inaugural Session-II.

3) Day 2 - Session 1:-

1. **Title "Graduating from Quantity to Quality: Making Our Agriculture, Livestock, and Fishery Globally Competitive."**
2. Moderated by Mr. Balram Singh Yadav, Past Chairman of CLFMA of India, the session featured engaging discussions from esteemed speakers and panelists Smt. Alka Upadhyaya, Shri. Rajesh Kumar Singh, and Shri. Tarun Shridhar.
3. **Smt. Alka Upadhyaya** announced that the Animal infrastructure development fund has shown promising results and has been extended to further support the growth of the livestock sector. She invited private players to come forward and invest in livestock sector as well.
4. **Shri. Rajesh Kumar Singh** brought attention to the robust Public-Private Partnership. He emphasised on the formalization of the livestock sector. While the dairy industry has made significant strides in formalization, there is still room for improvement in the meat sector.
5. **Shri. Tarun Shridhar** said that let us not just measure our success in numbers or quantity, but in the value, we bring to the market. As the largest and most populous country, we have the potential to be the biggest market in the world. He is very optimistic that together, we can create a sustainable and prosperous future for the food production sector.

4) Day 2 - Session 2:-

1. **Title – "Challenges of Feed Security: Bridging the Demand and Supply Gap."**
2. The session was moderated by Mr. Neeraj Kumar Srivastava and the esteemed panelists included Shri. G. N. Singh, Dr. Praveen Malik, Mr. Naveen Pasuparthi, and Dr. Sandeep Karkhanis.
3. Most important point was raised by **Dr. Sandeep Karkhanis** at the end of the session by asking the audience and the panelist a very serious issue that Can we start pushing on GM variety to be introduced in India to increase productivity. He also said that We must prioritize cultivating high-yield varieties of maize and explore new products like bajra and sorghum for animal feed. Disease challenges and the availability of raw materials must be closely addressed by lawmakers and policy makers.
4. **Shri. G. N. Singh** highlights the importance of environmentally responsible production practices and reducing dependence on foreign products. He also emphasized the need to address future challenges by finding solutions within their own country, such as establishing cooperatives. Additionally, they stress the significance of tapping into the potential of the domestic market, specifically in the animal compound feed market, and advocating for a liberal policy approach to attract investments and promote entrepreneurship in the poultry and dairy sectors.
5. **Mr. Naveen Pasuparthi** brought up the issue of investment in alternative protein sources like insect protein.
6. **Dr. Praveen Malik** continuously emphasized on Industry to prioritize R&D and collaborate with the private sector to find innovative solutions. The private sector should actively engage in R&D collaborations to meet industry requirements.

5) Day 2 - Session 3:-

1. **Title - "Development Initiative and Regulatory Framework"**
2. Panelists include Dr. Sujit K. Dutta, Dr. Gagan Garg, Smt. Suneeti Toteja, Dr. Monica Puniya, Dr. Prashant Shinde and Mr. Suresh Rayudu Chitturi.

3. With engaging presentations our esteemed panelists highlighted on ensuring the safety and develop standards of animal feed.
4. **Dr. Monica Puniya** said "Ensuring the safety of animal feed is not just about protecting animals, but also about safeguarding their health. She suggested several rationales for including animal feed in FSS act 2006. By including animal feed in the FSS Act 2006, we aim to improve the quality of raw materials, control manufacturing and distribution, and ultimately, guarantee the safety of our food chain."
5. **Smt. Suneeti Toteja** raised one crucial aspect of involving stakeholders and representatives from consumer bodies and the government sector in our national level technical committees. By doing so, we can ensure that our decision-making processes are inclusive and consider a wider perspective.
6. **Mr. Suresh Chitturi** pointed out that the focus of vaccines in our country seems to be primarily on one disease. He stressed the need for a more comprehensive approach, with vaccines developed for a wider range of diseases that affect the poultry industry. Without up-to-date vaccines, farmers are left vulnerable to the constant threat of outbreaks, putting their livelihoods at risk. He called for the government and regulators to step in and provide support in proper survey of poultry diseases and manage data to the industry in addressing both these crucial issues.
7. **Dr. Prashant Shinde** referred to previous speakers to make his comment. "While the committee formation and the scientific research background are commendable, it is essential that experts with practical industry knowledge are included to ensure the voice of the industry is considered. We are willing to share our data and collaborate for a better outcome."
8. **Dr. Sujit K. Dutta** said "Standards should be made mandatory. Industry collaboration and data-driven standards are the key to ensuring effective and implementable solutions. Governments should empower industries to drive the standards, as they are the ultimate buyers of these regulations."
9. At the end **Dr. Gagan Garg** shed light on the topic of the session saying "Regulating the import and export of animal feed is crucial. And to make standards, a clear draft of specific requirements is necessary within the industry. You are expected to present a draft document that clearly outlines what you need. This draft serves as a preliminary outline or blueprint of your expectations or specifications."

Throughout the session, the panelists engaged in a lively discussion, exchanging ideas and addressing questions from the audience. They emphasized the need for collaboration between government bodies, industry stakeholders, and regulatory agencies to create a conducive environment for the growth of the animal husbandry industry.

The event also included the felicitation of sponsors, media, guests, and invitees, which was conducted by Mr. Sandeep Kumar Singh. The memento distribution was carried out as per the prearranged list. The session concluded with a vote of thanks delivered by **Dr. Anup Kalra, President North Zone – II, CLFMA OF INDIA** expressing gratitude to all the distinguished guests, esteemed speakers, delegates, and participants for their valuable contributions and making the 64th National Symposium, 2023 a grand success.

At the end of the Symposium, a networking dinner was held to provide an opportunity for participants to further engage and build connections. The Symposium received an overwhelming response from participants, including industry professionals, government officials, researchers, and students. It provided an excellent platform for networking, knowledge sharing, and collaboration within the livestock sector.

Overall, CLFMA interacted with various stakeholders in the industry and government on the topic "**Livestock Sector: Looking Beyond the Present**". The association has diverse membership from across the animal protein value chain including feed manufacturing; poultry, dairy, and aquaculture business; animal nutrition and health, veterinary services, machinery, and equipment; processing, distribution, retailing of meat and Associations - National & International.

The program was well appreciated by all participants.

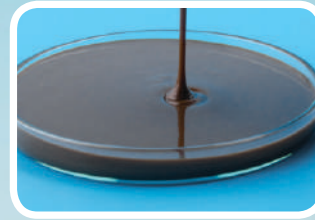
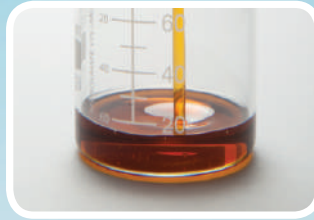
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may affect the
immunity and
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performance
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The Future of Animal Husbandry in India - A Poetic Keynote Address by Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA and Chairman & MD of Godrej Industries Ltd. dated August 18, 2023.

Our portfolio looks diversified
But much of what we have tried
Was something that we slipped
into.
For animal feed this proved quite
true.
For compound feed there seemed
no need.
Then Bühler sought out L & T
Together they had tried to see,
If any market might exist.
There were no takers on their list.
Thus forced to make a clean swipe
They were then left with a
prototype.
A discount customer was sought
And Godrej were the ones who
bought.
Fifty years have passed since then
A life in America was spurned
And so in '76 I returned.
In Animal Feed I played a role.
Helping Farmers was the goal.
Now agriculture's growth is slow
And the only sub-sector that we
know
With really good growth potential
Is animal husbandry and it's
essential
That this sector should rapidly
grow
For agriculture to clearly show
It can approach the heady growth
Of the other sectors, as both
Services and industry
Are known to grow rapidly.
And without growth there'll be no
charm
In struggling on at the farm.
The demand for milk, fish, meat and
eggs
Stands on very sturdy legs:
As the population rises
And the nation urbanises
Women will work more and more
And so consumption's bound to
soar.
The people will have time to roam,
More meals will be outside the

home.
And all will find it rather nice
That we don't need to raise our
price.
I don't intend to be rude
But pulses are no fancy food.
And yet their price is now so high
That truffles too might heave a sigh!
Now cereals make for hearty fare
They do provide a major share
Of calories on the cheap
And protein, at a price not steep.
Alas! All cereals' nature's such
Their protein content isn't much.
Now pulses have a wee bit more
But not much more and that's for
sure!
Indeed when it's correctly seen
As good digestible protein
None of the pulses have a lot.
Agronomically they've lost the plot
As all their yields are very low.
And often imports need to flow.
And yet the prices rise each day.
No one seems to know the way
To get their yields to improve
For they are stuck in a groove.
Few plants that grow in the field
Have a decent protein yield.
The soya bean is an exception
But as a food it meets rejection.
Because of its reasonable yield
It's protein's cheap while in the
field.
It's not palatable till modified,
Not edible till detoxified.
And all of this adds to the cost
Much of the benefit is lost.
Since we're not yet allowed to grow
Varieties that are GMO.
Our current yields are very low
We have a shortage, as you know.
This might lead to confusion
But for a simple conclusion-
The answer lies, as we will see
Within our own industry.
The way to go is innovation.
Quick progress will help our nation.
For our nation, benefits are seen

The provision of quality protein.
Animal husbandry can be planned
With a poor quality of land.
Our Forex Reserves we can replete
With exports of shrimp and meat.
There are many animals we can
grow.
Cattle, chicken, shrimp we know.
But other species are also there
We could greatly increase their
share
I do believe it would be wise
Supporting a startup that bravely
tries
To reach out and organise
The minor species found here and
there
And support them everywhere.
Turkeys, ducks, goats and sheep,
All this and more we can reap.
Murrels, crabs, geese and quail.
Of exotic species we can avail!
In insects one already sees
The culture of silkworms and bees
But many nations are already
steering
To widespread insect rearing.
The poultry scene is generally
bright
But in crises customers take fright.
Whether it's Covid or it's Flu
In every wave there is a slew
Of bad news that's misconstrued.
Consumption then gets subdued.
We often wonder, Why Oh! Why
Does demand just collapse or die?
It can fall and even sink
Without the slightest logical link.
When Chikungunya widely spread
The Chicken Duniya badly bled!
We go through all these crazy antics
Based on sound and not semantics!
The sector's value addition's low
The farmers lack benefits that flow.
In this commoditised industry
High volatility is what we see.
Now profits soar and then they fall
It's very hard to take a call!
The big problems that I see

Are small scale, labour intensity.
 There's scope for digitisation
 As well as efficient automisation.
 Network effects can overwhelm
 scale
 There are many benefits farmers
 can avail:
 Input supply and output sale,
 Reliable advice, without fail.
 The technology of this new age
 Boosts both income as well as
 wage.
 Now farmer income's very low.
 So how can we make it grow
 Yes, doubling income is the call.
 But this initiative may fall
 As animal husbandry's neglected.
 So the government has selected
 Two funds to get the sector started
 The funding's large and bighearted.
 If we were to get our act right
 The future will be very bright.
 An end to protein deficiency,
 High levels of efficiency,
 New technologies unfurled,
 Exports to the Gulf and the world.
 In milk we already lead.
 In all the others let's succeed.
 Let us be bold, green and wise.
 Let us strive and seize the prize,
 Provide our people with good
 health
 And our farmers with some wealth!
 But of the Agri GDP
 One third's animal husbandry.
 The dairy growth is very steady
 But poultry's growth is truly heady.
 One thing we should understand
 Fast dairy growth requires more
 land
 If we multi-crop the field
 And improve the fodder yield
 Our dairy sector would then grow
 And milk will surely overflow.
 Now poultry is the way to go.
 There are two products as we know
 There is the egg and then there's
 meat.
 The egg is an amazing thing
 And I for one could always sing
 Its praises, for it's packaged well



With its own protective shell.
 And in it you will surely find
 Fine nutrients of every kind.
 It can be cooked in many ways
 Prepared in minutes, not hours or
 days.
 And I don't want to sound
 contrarian
 But sterile eggs are vegetarian.
 Not just an ordinary view but
 rather,
 The considered view of our nation's
 father.
 For both eggs and meat you should
 know
 That poultry feed conversion's low.
 Unlike cows they don't eat grass
 But in a sense they also pass.
 Soya meal and corn are fed
 And though perhaps it could be said
 That these are foods that we might
 eat
 No one would treat them as a treat.
 And can we make the case much
 better
 Not just in spirit but in letter
 Make a feed that won't compete
 With any food, that humans eat.
 Can we fulfil such a dream?
 With newer enzymes it would seem
 The digestibility could be bettered
 Locked nutrients could be
 unfettered.
 And what would be your reactions
 To feed made from low cost
 extractions?
 I'm sure you'd all be delighted
 A golden era has been sighted
 With rapid poultry growth in store
 And the ability to feed many more
 Without the use of added land
 Can help us meet the food demand.
 The government can play role
 And help us all achieve the goal.
 We will now have to brace
 For challenges that we'll face.
 Animal husbandry is under attack
 There are many issues we must
 track.
 Now cruelty is at the fore
 But it's not the only one for sure.
 Environment and economics



Are also factors we have to fix.
 Feed conversion may seem high
 But the raw numbers don't really fly
 But dry matter conversion we all
 know
 Can indeed be very low.
 Efficiency improvement we can try
 This could make us groan and sigh.
 These are issues we have to face
 But there is a saving grace.
 The higher cost would make us
 frown
 But efficiency can bring costs down.
 The better amino acid profile
 And micronutrients would make us
 smile.
 Another benefit that we see
 With efficient technology
 The carbon footprint also falls.
 We have to take these dual calls.
 Eggs and milk are well perceived
 Generally they are well received.
 But plant based meats are on the
 rise.
 Cultured meat is the prize.
 Right now the costs are very high.
 This will take some time to fly.
 There is a huge commercial bar.
 The first we'll crack is foie gras.
 This indeed makes sense to try
 As cost and cruelty are high!
 Both plant based and cultured meat
 Will prove to be a considerable feat.
 On cruelty as well as cost
 They could win with not much lost.
 But it must still be confessed
 If products are highly processed,
 On naturalness they may lose out.
 This indeed could be a doubt.
 Our heads though can't be in the
 sand
 In fact we have to understand
 These changes will come our way
 They will indeed arrive some day.
 Till then we must do our best.
 We must pass the efficiency test.
 This is indeed a big ask.
 But we are up to the task!
 To study what new technology
 Could possibly help us to be
 Quite hunger free, sustainably.
 What is the challenge that we see?

Greater resources, it can be seen,
Are needed to produce protein.
In India we are rather short
And therefore all of us now ought
To find a more efficient way
To produce protein and save the
day.
In India milk yields are very low.
This adds to costs, as we all know.
More cows are grown, more feed is
fed.
You also need a bigger shed.
And all this leads to higher cost
But something else is also lost.
The consequences are very dire
As carbon emissions are also higher.
There is a tool that we can wield
And that of course is higher yield.
Now normal breeding's very slow.
There is a faster way, we know.



We asked ourselves what could then
be
The cutting edge technology.
In agriculture Israel leads
And IVF met our needs.
Now cross-breeds are a
compromise
And that approach once seemed
wise.
The compromise that one would see
Was between yield and immunity.
Human nature is always loath
To give up something as we want
both!
Of course we want the highest yield
And Indian immunity in the field.
The best yield from both sperm and
egg
While immunity stands on another
leg!
Not from parents but something



other
The placenta of the surrogate
mother!
Now NGCARD our research station
Is a fountain head of innovation.
We know they can succeed
In remediating low value feed
For us an even greater hope
Is the tremendous scope
Of rumen bypass technology
The benefits that we see
Are lower cost or higher yield
This is the power that we can wield!
With steady progress in newer feed
Along with our superior breed
We are now sure we can succeed
In providing protein, our dire need.
If we reduce our footprint as well as
cost.
It will be a while before all is lost.



CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Registration of Delegates



Registration of Delegates



CLFMA Executive Director Ms. Chandrika Venkatesh welcomed CLFMA Members for 56th Annual General Meeting



CLFMA OF INDIA 56th AGM – Office Bearers on dias



Mr. Suresh Deora, Chairman, CLFMA OF INDIA started AGM proceedings



Mr. Suresh Deora, Chairman, CLFMA OF INDIA presented all CLFMA Activities throughout his tenure.



CLFMA Members at 56th Annual General Meeting



CLFMA Members at 56th Annual General Meeting

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Minutes of the Extra Ordinary General Meeting read and Annual Report 2022-2023 presented by Hon. Secretary Mr. Abhay Shah



Audit Report & Audited Statement of Accounts for the year 31st March 2023 presented by Treasurer Mr. Nissar F. Mohammed



Q & A Session at 56th Annual General Meeting



Q & A Session at 56th Annual General Meeting



CLFMA Office Bearers Mr. Divya Kumar Gulati, Dy. Chairman, Mr. Abhay Shah, Hon. Secretary, Mr. Suresh Deora, Chairman, along with Dr. Anup Kalra, North Zone President - II



CLFMA Office Bearers Mr. Divya Kumar Gulati, Dy. Chairman & Mr. Suresh Deora, Chairman



Arrival of Chief Guest, Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, Government of India.



Chief Guest, Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, Government of India with Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA and Chairman & MD of Godrej Industries Ltd., at CLFMA's National Symposium 2023

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Auspicious lighting of the lamp by CLFMA's esteemed guest, Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. at the inaugural session I



Lighting of the lamp by Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd. at the inaugural session I



Lighting of the lamp by CLFMA Chairman, Mr. Suresh Deora at the inaugural session I



Office Bearers of CLFMA alongwith Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI, Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd at the inaugural session I



Audience



CLFMA Chairman, Mr. Suresh Deora felicitating, Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. at the inaugural session I



CLFMA Chairman, Mr. Suresh Deora felicitating, Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. at the inaugural session I



Welcome address by Mr. Divya Kumar Gulati, Convenor and Dy. Chairman, CLFMA OF INDIA

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



CLFMA Chairman, Mr. Suresh Deora, Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI.
Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd. on the dias



Mr. Suresh Deora delivering Chairman's Address



Mr. B. S. Yadav, Past Chairman of CLFMA introduced Mr. Nadir B. Godrej



The Life time achievement awardee - Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd.



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. felicitating to Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd., A Lifetime Achievement Awardee



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. felicitating to Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd., A Lifetime Achievement Awardee



CLFMA Office Bearers along with Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd.-A Lifetime Achievement Awardee & Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



Mr. Nadir B. Godrej thanked CLFMA and spoke about his journey in the animal feed business.

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Mr. S. V. Bhavare introducing Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



The Life time achievement awardee - Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. felicitating Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. felicitating Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. felicitating Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



Shri. Tarun Shridhar, IAS, (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI. humbly thanked CLFMA for the honour and nostalgically remembered the importance of the livestock sector



Launching of Survey Report Volume - II



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. delivering Chief Guest Address

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For further information please contact us:

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CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI, highlighting the government's commitment to the development and growth of the Livestock sector in the country



Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI. & Mr. Nadir B. Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd. on the dias



The Inaugural Session I concluded with a vote of thanks delivered by Mr. Abhay Shah, Honorary Secretary



The Inaugural Session I dias



The Inaugural Session I dias



CLFMA Office Bearers, Past Chairman & Mr. Nadir Godrej Family with Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI.



CLFMA Managing Committee Group Photo at the Inaugural Session I



Media Coverage - Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI.

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Media Coverage - Shri. Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry & Dairying, GOI.



CLFMA Chairman alongwith Immediate Past Chairman and other dignitaries



Lighting of the lamp by Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Dept of AH&D, Ministry of F, AH&D, GOI. along with the Office Bearers & Other Dignitaries at the inaugural session II



Lighting of the lamp by Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, the inaugural session II alongwith other dignitaries



Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D & Other dignitaries at inaugural session II



CLFMA Chairman Mr. Suresh Deora felicitating Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Dept of AH&D, Ministry of F, AH&D, GOI.



CLFMA Chairman Mr. Suresh Deora felicitating Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Dept of AH&D, Ministry of F, AH&D Ministry of F, AH&D, GOI.



Mr. Sumit Sureka, Dy. Chairman felicitating a Key Note Speaker Mr. Nadir Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd.

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Mr. Sumit Sureka, Dy. Chairman felicitating a Key Note Speaker Mr. Nadir Godrej, Past Chairman, CLFMA OF INDIA, and Chairman & MD of Godrej Industries Ltd & other dignitaries on dias



Mr. Divya Kumar Gulati, Dy. Chairman felicitating Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



Mr. Divya Kumar Gulati, Dy. Chairman felicitating Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



Mr. Divya Kumar Gulati, Deputy Chairman of CLFMA of India, delivered the welcome address



Life Time Achievement Awardee's Standing ovation from CLFMA Members



Life Time Achievement Awardee's Standing ovation



Inaugural Session II dias



Mr. Suresh Deora, CLFMA Chairman addressing the audience

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



CLFMA Audio Visual Presentation showcased the achievements and initiatives undertaken by CLFMA



Mr. Nadir Godrej, Past Chairman, CLFMA OF INDIA & Chairman & MD of Godrej Industries Ltd delivering Key Note Address



Mr. Suresh Deora, CLFMA Chairman felicitating Mr. Nadir Godrej, Past Chairman, CLFMA OF INDIA & Chairman & MD of Godrej Industries Ltd, Keynote Address



CLFMA Lifetime achievement awardee Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI. shed light on the theme 'Livestock Sector: Looking Beyond the Present' and shared valuable insights.



Mr. Divya Kumar Gulati, Deputy Chairman felicitating Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI.



Dr. Devender Hooda citation of Dr. Anand Kumar Phatak, CLFMA Awardee



Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Department of AH&D, Ministry of F, AH & D, GOI. felicitating Dr. Anand Kumar Pathak



Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Department of AH&D, Ministry of F, AH & D, GOI. felicitating Dr. Anand Kumar Pathak

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Dr. Saikat Saha citation of Dr. Pankaj Kumar Singh, CLFMA Awardee



Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F, AH & D, GOI. felicitating Dr. Pankaj Kumar Singh, CLFMA Awardee



Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Department of AH&D Ministry of F, AH & D, GOI. felicitating Dr. Pankaj Kumar Singh, CLFMA Awardee



Launching of Souvenir 2023



Guest Address by Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Department of AH&D Ministry of F, AH & D, GOI.



Dr. O. P. Chaudhary, Joint Secretary (NLM/PC), Department of AH&D Ministry of F, AH & D, GOI. addressed the audience, highlighting the initiatives undertaken by the Department of AH&D to promote the growth of the animal feed industry.



Vote of Thanks by Mr. Abhay Shah, Hon. Secretary, CLFMA



Inaugural Session II Group Photo

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Dr. Hansraj Khanna along with CLFMA Chairman Mr. Suresh Deora and other dignitaries



Cultural Programme



Cultural Programme



Audience – Session I



CLFMA Chairman Mr. Suresh Deora & North Zone President II Dr. Anup Kalra along with Mr. Amit Sachdev & Mr. Reece H. Cannady of US Grains Council



CLFMA Office Bearers along with Mr. R. Ramkutti, South Zone President



Welcome Address by Mr. Suresh Deora, Chairman of CLFMA at Symposium 2023



Introduction of Symposium 2023 by Mr. Sandeep Kumar Singh, Dy. Chairman of CLFMA

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Mr. Abhay Shah, Hon. Secretary of CLFMA felicitating Mr. B. S. Yadav, Past Chairman of CLFMA and Session I Moderator



Mr. Sumit Sureka, Dy. Chairman introducing Smt. Alka Upadhyaya, IAS, Secretary AHD, Dept. of AH&D, Ministry F,AH&D, GOI.



Mr. Divya Kumar Gulati, Dy. Chairman, CLFMA felicitating Smt. Alka Upadhyaya, IAS, Secretary AHD, Dept. of AH&D, Ministry F,AH&D, GOI.



Mr. Naveen Kumar Pasuparthi, Dy. Chairman, CLFMA introducing Shri. Rajesh Kumar Singh, IAS, Secretary, Department for Promotion of Industry, and Internal Trade (DPIIT), GOI.



Mr. Neeraj Kumar Srivastava, Immediate Past Chairman, CLFMA felicitating Shri. Rajesh Kumar Singh, IAS, Secretary, Department for Promotion of Industry, and Internal Trade (DPIIT), GOI.



Mr. Nissar F. Mohammed, Treasurer, CLFMA felicitating Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F,AH & D, GOI.



Mr. Nissar F. Mohammed, Treasurer, CLFMA along with Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F,AH & D, GOI. Session I Speaker



Mr. B. S. Yadav, Past Chairman of CLFMA and Session – I moderator along with Session I Panelist

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Mr. B. S. Yadav, Past Chairman of CLFMA moderating Session - I



Smt. Alka Upadhyaya, IAS, Secretary AHD, Dept. of AH&D, Ministry of F&AH&D, GOI. - Speaker of Session I



Shri. Rajesh Kumar Singh, IAS, Secretary, Dept. Promotion of Industry, and Internal Trade (DPIIT), GOI. - Speaker of Session I



Shri. Tarun Shridhar, IAS (Retd.), Former Secretary, Dept. of AH&D, Ministry of F&AH & D, GOI. - Speaker of Session I



Session I Moderator and Speakers along with CLFMA Chairman Mr. Suresh Deora and Dy. Chairman Mr. Divya Kumar Gulati



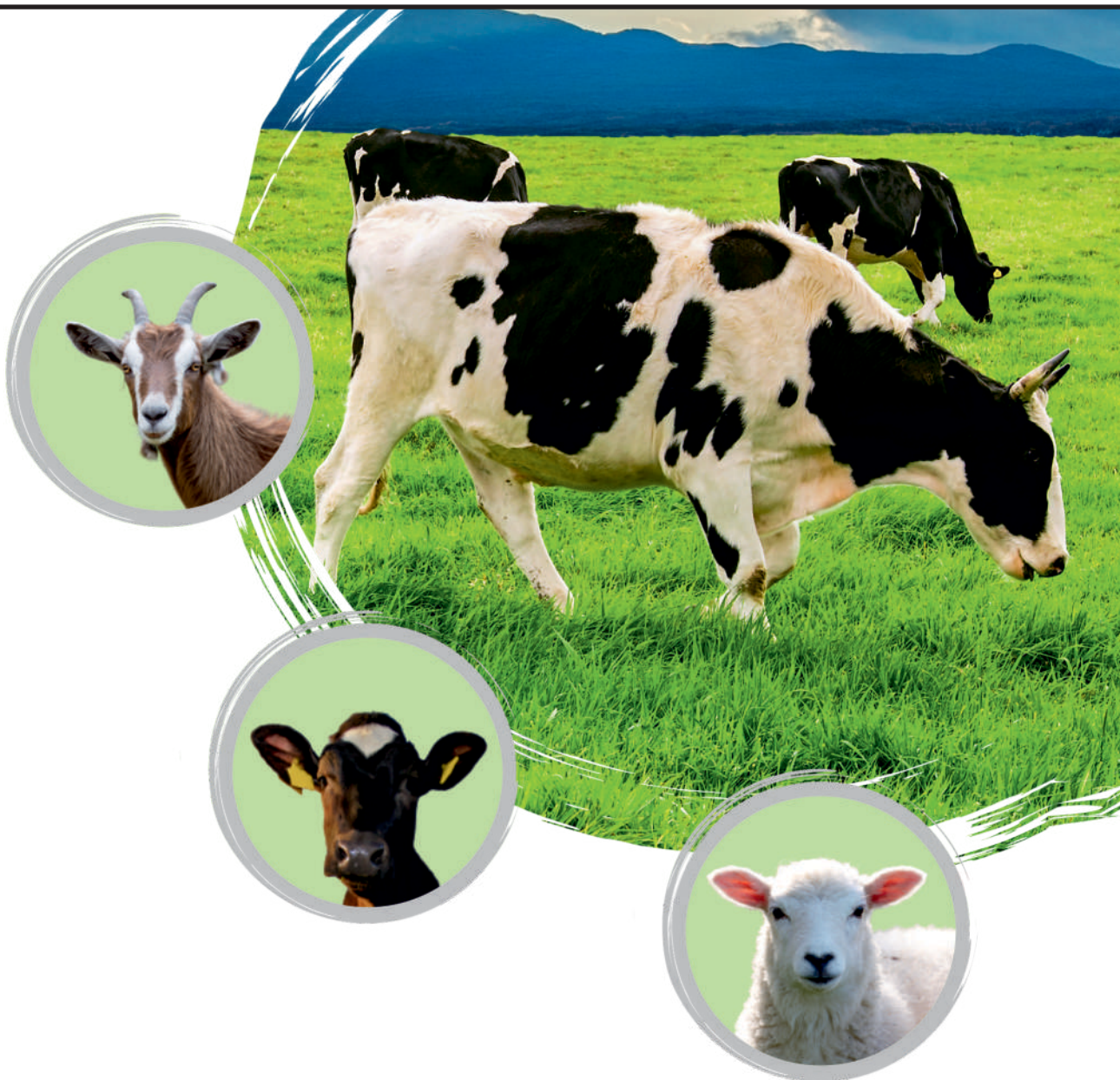
Mr. Divya Kumar Gulati, Dy. Chairman of CLFMA felicitating Mr. Neeraj Kumar Srivastava, Immediate Past Chairman of CLFMA and Session II moderator



Dr. Devender Hooda, North Zone President I, CLFMA introduced Shri. G. N. Singh, Joint Secretary (Admin/Trade/GC/IC/IT), Dept. of AH & D, Ministry of F, AH&D, GOI.



Mr. Jaison John, Managing Committee Member, CLFMA felicitating Shri. G. N. Singh, Joint Secretary (Admin/Trade/GC/IC/IT), Dept. of AH & D, Ministry of F, AH&D, GOI.




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Dr. Prashant Shinde, MC Member, CLFMA felicitating Dr. Praveen Malik, CEO, Agrinnovate India Ltd., (A Govt. of India Enterprise), New Delhi



Mr. Nissar F. Mohammed, Treasurer of CLFMA felicitating Mr. Naveen Pasupathy, Dy. Chairman of CLFMA and Industrial Representative - I



Dr. P. S. Mahesh, Jt. Commissioner & Director of CEAH felicitating Dr. Sandeep Karkhanis, Member, CLFMA OF INDIA and Industrial Representative - II



Mr. Neeraj Kumar Srivastava, Immediate Past Chairman of CLFMA moderating Session II



Session II Panelists along with the Moderator



Session II Industrial Representative - Dr. Sandeep Karkhanis, Member, CLFMA OF INDIA



Session II Industrial Representative - Mr. Naveen Pasupathy, Dy. Chairman of CLFMA



Session II Panelist Shri. G. N. Singh, Joint Secretary (Admin/Trade/GC/IC/IT), Dept. of AH & D, Ministry of F, AH&D, GOI.

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Session II Panelist Dr. Praveen Malik, CEO, Agrinnovate India Ltd., (A Government of India Enterprise), New Delhi



Dr. P. S. Mahesh, Jt. Commissioner & Director of CEAH briefed about CEAH



Q & A Session of Session II



Q & A Session of Session II



Session II Panelists along with the Moderator



Mr. Divya Kumar Gulati, Dy. Chairman, CLFMA and Convenor invited all the panelists on the Stage



Mr. Abhay Shah, Hon. Secretary of CLFMA introduced Dr. Sujit K. Dutta, Joint Commissioner (AH), Dept. of AH&D, Ministry of F&AH&D, GOI.



Mr. Balam Bhattacharya, East Zone President of CLFMA introduced Dr. Gagan Garg, Dy. Commissioner (Trade), Dept. of AH&D, Ministry of F&AH&D, GOI, Smt. Suneeti Toteja, Scientist – E, BIS, GOI & Dr. Monica Puniya, Dy. Director, FSSAI, GOI.

CLFMA OF INDIA's 56th AGM & 64th National Symposium 2023



Session III Panelists along with the Moderator



Dr. Anup Kalra, North Zone President II, CLFMA felicitating to Dr. Sujit K. Dutta, Joint Commissioner (AH), Dept of AH&D, Ministry of F&AH&D, GOI.



Dr. Anup Kalra, North Zone President II, CLFMA felicitating to Dr. Gagan Garg, Dy. Commissioner (Trade), Dept. of AH&D, Ministry of F&AH&D, GOI.



Mr. Narender Reddy K, CLFMA MC Member, felicitating Smt. Suneeti Toteja, Scientist - E, BIS, GOI.



Mr. Narender Reddy K, CLFMA MC Member, felicitating Dr. Monica Puniya, Dy. Director, FSSAI, GOI.



Mr. Naveen Pasuparth, Dy. Chairman, CLFMA felicitating Dr. Prashant Shinde, MC Member, CLFMA OF INDIA & Industrial Representative I



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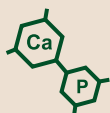
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Micronutrients to Boost Fertility of Dairy Animals: A Practical Perspective

M.S. Mahesh^{1*} and Muneendra Kumar²

Introduction

While milk productivity drives the major on-farm revenue in dairying, reproductive performance contributes to both profitability and sustainability. Hence, it is imperative to ensure optimum reproduction at farm. Some of the most common practical yardstick to measuring reproductive efficiency in dairy cows are: inter-calving period (i.e., one calf per year) and the number of services per conception (i.e., ideally less than two) etc. However, as productivity of cows is in the increasing trend worldwide due to intense genetic selection for high dairy merit, of late, reproduction is reported to be somewhat compromised as nutrients are primarily channelised for milk synthesis as against reproduction. It has been reported that the average conception rate in India is low, which is about 35%, representing a serious impediment to dairy sustainability. Unless the reproduction is optimised, it may lead to higher incidence of culling rates (up to 30%) and consequently cause a potential shrink in farm profits. It should be noted that, besides endocrine (hormonal) factors, day-to-day “management” also has a significant role in achieving reproductive success.

It is well-recognised that “balanced feeding”—that is adequate in major/macronutrients (energy, protein and fats) as well as minor/micronutrients (minerals and vitamins)—has been the cornerstone of productive and reproductive performance of dairy cows. Whereas, forages and concentrates supply major nutrients, for the dietary adequacy of micronutrients, extraneous supplementation is necessary. In this backdrop, this article comprehensively discusses some aspects of the micronutrients as relevant to reproduction of dairy animals within a practical framework of Indian dairy husbandry.

What are the common reproductive abnormalities?

The following are some of the most common reproductive abnormalities seen in dairy animals:

- **Infertility:** Temporary loss of fertility.
- **Sterility:** Permanent failure of fertility.
- **Anoestrus:** Failure of normal cycling to return after calving.

- **Repeat breeding:** Failure to conceive despite at least three or more consecutive inseminations.
- **Retention of foetal membranes:** Failure to expel foetal membranes (placenta) within 24 hours after parturition.

Micronutrients

Out of several factors influencing reproductive process in dairy animals, micronutrient deficiency is one of the main causes of infertility, leading to reproductive failure. Broadly, there are two nutrient categories within micronutrients, as below:

(i) Minerals

These are classified into two groups:

- a. Major/macro-minerals: Calcium, phosphorus, magnesium, potassium, sulphur, sodium and chlorine.
- b. Trace/micro-minerals: Zinc, copper, manganese, iron, iodine, cobalt, selenium, chromium, fluorine and molybdenum

(ii) Vitamins

These are classified into two groups:

- a. Fat-soluble vitamins: A, D3, E and K.
- b. Water-soluble vitamins: B-complex and vitamin C.

Although both minerals and vitamins generally constitute not more than 3% of total dietary dry matter, these do play a pivotal role in cellular metabolism as co-factors/co-enzymes as well as other roles regulating reproductive functions (Fig. 1; Table 1-3).

Fig. 1. General functions of micronutrients in animals

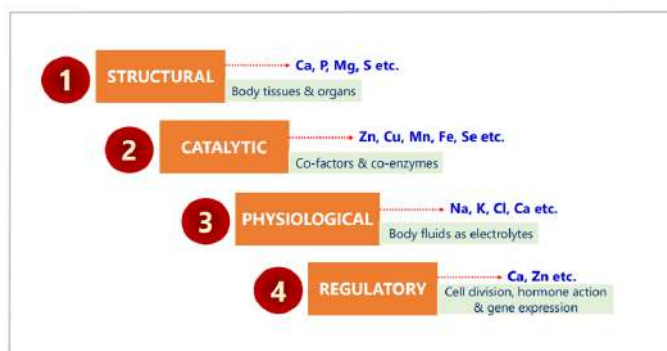


Table 1. Potential roles and requirements of various mineral elements in dairy animals

Mineral	Function	Concentration in the diet	Deficiency symptoms	Common feed sources
Calcium (Ca)	Bone and teeth formation, blood clotting, muscle contraction, 0.12% in milk and 0.23% in colostrum	0.65-0.80%	Milk fever in adult cows, rickets in calves, slow growth and bone development and decreased milk production	Leguminous forages, limestone (38%) and dicalcium phosphate(20%)
Phosphorus (P)	Bone and teeth formation, energy metabolism, component of DNA and RNA, phospholipid synthesis and 0.09% in milk	0.35-0.45%	Bone fragility, poor growth, depraved appetite (pica) and reproductive failure (anestrous)	Cereal grains, grain by-products (bran), oil seed meals and dicalcium phosphate (18.5%)
Magnesium (Mg)	Enzyme activator, found in skeletal tissue and bone, important for muscle relaxation and co-factor in second messenger systems in cell communication	0.25-0.35%	Irritability, hypomagnesaemic tetany (cows), milk tetany (calves) and increased excitability	Magnesium oxide (54-60%), magnesium sulphate (10-17%) and forages
Sodium (Na)	Acid-base balance, muscle contraction, nerve transmission	0.28-0.45%	Craving for salt, reduced appetite, severe cases follow incoordination, weakness, shivering and death	Common salt (40%) and sodium bicarbonate
Chlorine (Cl)	Acid-base balance, HCl production in abomasum	0.28-0.35%	Craving for salt, reduced appetite	Common salt (60%)
Sulphur (S)	Rumen microbial protein synthesis, found in cartilage, tendons and amino acids	0.20-0.22%	Growth retardation, decreased milk production and reduced feed efficiency	Elemental sulfur, sodium sulphate (10%), potassium sulphate (28%), protein supplements and legume forages
Potassium (K)	Maintenance of electrolyte balance, enzyme activator, muscle and nerve function	1.0-1.6%	Decreased feed intake, loss of hair glossiness, lower blood and milk potassium	Legume forages, oat hay, potassium chloride (50%) and potassium sulphate (41%)
Iodine (I)	Synthesis of thyroid hormones, regulation of basal metabolic rate	0.45-0.60 mg/kg	Goitre in calves	Iodised salt, potassium iodide (69%), potassium iodate (58%) and EDDI
Iron (Fe)	Part of haemoglobin and many enzymes	50 mg/kg	Nutritional anaemia	Forages and grains
Copper (Cu)	Needed for the synthesis of haemoglobin, part of many enzymes	12-16 mg/kg	Severe diarrhoea, abnormal appetite, poor growth, coarse graying hair coat and osteomalacia	Copper sulphate (25%)
Cobalt	Part of vitamin B ₁₂ , needed for growth of rumen microbes	0.11 mg/kg	Failure of appetite, anaemia, decreased milk production and rough hair coat	Cobalt sulphate and cobalt chloride
Manganese (Mn)	Growth, bone formation, enzyme activator	45-55 mg/kg	Delayed signs of estrus and poor conception	Manganous oxide (52-62%) and manganous sulphate (27%)
Zinc (Zn)	Enzyme activator and influences immune response	45-55 mg/kg	Decreased weight gains, lowered feed efficiency and skin ailments	Forages, zinc oxide (46-73%), zinc sulphate (22-36%) and zinc methionine
Selenium (Se)	Component of glutathione peroxidase, cellular antioxidant functions with vitamin E	0.3-0.5 mg/kg	White muscle disease in calves and retained foetal membranes	Oil cakes, forages, sodium selenite
Molybdenum (Mo)	Part of enzyme xanthine oxidase	---	Loss of weight, emaciation and diarrhoea	Widely distributed in feeds

Adapted from Risco and Retamal (2011): Dairy Production Medicine. Wiley-Blackwell, UK.



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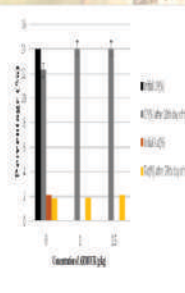


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Table 2. Potential roles of various vitamins in dairy animals

Vitamin	Function	Deficiency	Requirement*
Fat-soluble A (retinol)	Vision, gene transcription, immune function, reproduction, bone metabolism, epithelial integrity and antioxidant activity	Night blindness and calves born blind	110 IU/kg body weight or 1,00,000 IU/d
D ₃ (1,25 dihydroxy cholecalciferol)	Calcium homeostasis, induction of calcium-binding protein for intracellular Ca transport, secretion of insulin and prolactin, muscle function and immune response	Rickets in young and osteomalacia in adults	20,000 IU/d
E (α-tocopherol)	Antioxidant, involved in innate immunity and phagocytic cell activity	Muscle dystrophy, uterine diseases, retained placenta, risk of mastitis, impaired neutrophil function	2,000-4,000 IU/d in first 3-4 weeks postpartum followed by 1,000 IU/d
K (quinine) Water-soluble	Synthesis of blood clotting proteins	Delayed blood clotting and internal bleeding	Synthesised by rumen and intestinal microbes
B ₁ (Thiamin)	Co-enzyme role in energy metabolism, synthesis of neurotransmitters and passive transport of Na in nerve impulses	Polio-encephalomalacia (cerebrocortical necrosis)	Synthesised by rumen and intestinal microbes
B ₂ (Riboflavin)	Component of flavin adenine dinucleotide (FAD) and flavin adenine mononucleotide (FMN) and transfer of H in cellular reactions	--	Synthesised by rumen and intestinal microbes
B ₃ (Niacin)	Co-enzymes of nicotinamide, NAD and NADP, role in carbohydrate, protein and lipid metabolism and causes vasodilation	Dermatitis and hepatic lipidosis	Synthesised by rumen and intestinal microbes
B ₆ (Pyridoxine)	Pyridoxal phosphate participates in metabolism of carbohydrates, amino acids and lipid, incorporation of iron into haemoglobin and antibody production	Reduced growth, dermatitis, alopecia, anaemia, neurological symptoms and immunosuppression	Synthesised by rumen and intestinal microbes
B ₁₂ (Cobalamin)	Co-factor in single-carbon transfer, propionate metabolism and incorporation into TCA cycle, RBC synthesis and neural integrity	Deficiency occurs if diets are deficient in Co or if rumen microflora are destroyed, loss of myelin in nerve cells, causes megaloblastic anaemia, poor appetite and weakness	Synthesised by rumen and intestinal microbes
Folic acid	Co-factor, cell division and DNA methylation	Megaloblastic anaemia and neural tube defects in new borns	Synthesised by rumen and intestinal microbes
Biotin	Co-factor for carboxylase enzymes, involved in TCA cycle, gluconeogenesis and fat synthesis, participates in the production and deposition of keratin in horn and hooves	Dermatitis, weakness, paralysis of hind legs, reduced integrity of hoof and horn tissues	Synthesised by rumen and intestinal microbes
Pantothenic acid	Component of co-enzyme A, activation of fatty acids for oxidative metabolism in the mitochondria	Impaired fatty acid metabolism, increased ketogenesis and metabolic acidosis	Synthesised by rumen and intestinal microbes
C (Ascorbic acid)	Co-factor for enzyme activity, antioxidant, regenerates vitamin E, synthesis of collagen, phagocytic activity of leukocytes, synthesis of carnitine and adrenal cortical steroids	Deficiency (impaired synthesis of collagen) is rare	Synthesised from glucose by the liver
Choline	Phospholipid synthesis, cell membrane integrity, absorption and transport of fatty acid and cholesterol, synthesis of acetylcholine and transmethylation reactions	Hepatic lipidosis and ketosis	Not a typical vitamin. No requirements established although beneficial effects are observed when rumen protected forms are fed at 15-50 g/d

*As specified by NRC (2001): Nutrient Requirements of Dairy Cattle, USA.

Table 3. Role of specific micronutrients in reproduction of dairy animals

Micronutrient	Function	Possible deficiency conditions
Calcium	Uterine tonicity, involution and foetal growth	Dystocia, retention of foetal membranes and anoestrus
Phosphorus	Energy metabolism	Low conception rates, anoestrus and cystic ovaries
Copper	Various biochemical reactions, connective tissue formation and prostaglandin synthesis	Low fertility, post-partum anoestrus and abortion
Zinc	Metallo-enzyme and DNA/RNA synthesis	Infertility and low spermatogenesis
Iodine	Thyroid activity and basal metabolism	Still births, foetal resorption and cystic ovaries
Manganese	Metallo-enzyme, foetal growth, ovarian follicular growth and steroidogenesis	Silent heat and delayed ovulation
Cobalt	Propionic acid and glucose metabolism	Anaemia and non-functional ovaries
Chromium	Follicular maturation and luteinising hormone secretion	Early embryonic mortality (?)
Vitamin A and zinc	Tissue regeneration, anti-oxidant, steroidogenesis and spermatogenesis	Abortion, retention of foetal membranes and blind/weak calf
Vitamin D ₃	Calcium-phosphorus metabolism and foetal growth	Still birth and abortion
Vitamin E and selenium	Anti-oxidant (glutathione peroxidase)	Silent heat, mastitis, retention of foetal membranes and low sperm motility

Adapted and modified: Pal et al. (.2022)

From the above tables, it is evident that some of the micronutrients are directly associated with reproduction of males and females, whilst others have indirect roles.

How to ensure micronutrient adequacy in the diet?

The requirements for macro-minerals like Ca, P, Mg etc. as well as vitamins like vit. A, E etc. can be considerably fulfilled through the basal diet of forage and concentrates to a varying extent. On the other hand, micro-minerals need to be supplied through external sources to the extent of about 75% of the total requirements since their bioavailability remains questionable from the feed ingredient sources.

Let us consider an example of fulfilling Zn requirement in a cow producing 10 kg of milk and having a dry matter intake of 11 kg/d.

Requirement of Zn: 55 mg/kg diet. i.e., $55 \times 11 = 605$ mg/d.

If we supplement the cow with 50 g of BIS type-II mineral mixture (Table 4) containing 0.8% Zn, then:

The amount of Zn supplied will be: $50 \times 0.8\% = 400$ mg/d, which is about 66% of total daily Zn requirement, and with 75 g of this mineral mixture, complete Zn requirement can be accomplished without considering Zn furnished through the basal diet.

On the other hand, if this mineral mixture is incorporated at 2% of concentrate mixture and the cow is fed 4 kg of concentrate mixture, then:

The amount of Zn supplied will be: $4 \times 90\% \times 2\% \times 0.8\% = 576$ mg/d.

Alternatively, dairy farmers may be recommended to use area-specific mineral mixture, wherever it's locally available to augment production, reproduction, immunity and overall health status of animals. By whatever means, it should be remembered that on a 365-day basis, dairy animals must receive adequate micronutrient supplementation, fulfilling their requirements.

Table 4. BIS specifications for complete mineral mixture (BIS: fourth rev.)

Sl.No.	Characteristic*	Type-I	Type-II
1	Moisture, % by mass (Max.)	5	5
2	Calcium, % by mass (Min.)	16	20
3	Phosphorus, % by mass (Min.)	9	12
4	Magnesium, % by mass (Min.)	4	5
5	Salt (as NaCl), % by mass (Min.)	22	0
6	Iron, % by mass (Min.)	0.3	0.4
7	Iodine, % by mass (Min.)	0.020	0.026
8	Copper, % by mass (Min.)	0.078	0.100
9	Manganese, % by mass (Min.)	0.10	0.12
10	Cobalt, % by mass (Min.)	0.009	0.012
11	Fluorine, % by mass (Max.)	0.05	0.07
12	Zinc, % by mass (Min.)	0.64	0.80
13	Sulphur, % by mass	1.4-2.3	1.8-3.0
14	Acid-insoluble ash, % by mass (Max.)	2.4	3.0
15	Lead, % by mass (Max.)	16	20
16	Arsenic, % by mass (Max.)	5	7
17	Total ash, % by mass	81-88	78-85
18	Presence of proteinous/organic impurities	Shall pass the test	

*Except moisture, all other characteristics are on dry matter basis

How micronutrients help mitigate stress and contribute to better reproduction?

Transition management

Transition period (3 weeks before and after calving) represents a physiological stage of enormous stress to dairy animals, and the aim of transition management is to augment peak production, boost immunity, achieve early resumption of ovarian cyclicity as well as minimise calving-associated complications. Specific micronutrients such as rumen-protected choline (10 g/d of post-intestinal availability), biotin (20 mg/d) and niacin (6-12 g/d) are considered as critical transition nutrients along with vitamin D₃ and vitamin E. Organic (chelated) trace minerals like glycinate,

proteinate, propionate, amino acid chelates etc. are useful to increase mineral bioavailability in animals, which in turn may help improve reproductive performance post-calving. Additionally, during close-up transition (-15 days of calving), anionic mineral salts should be supplemented to achieve dietary cation-anion difference of -50 to -100 mEq/kg of diet to stimulate Ca homeostasis aiming at minimising the incidences of milk fever. Pre-partum transition feed should have a low Ca content (not exceeding 30 g/d), just to support maintenance function.

Summer (heat) stress

As the dry matter intake is relatively low during summer stress, the corresponding intakes of micronutrients as well as mineral retention are also low. NRC (2001) suggests higher dietary levels for some of the specific mineral elements for feeding during summer, as below (Table 5):

Table 5. Select mineral recommendations (% dry matter) during summer stress

Mineral	NRC (2001)	Summer stress	↑(%)
Sodium	0.18	0.4-0.6	122-233
Magnesium	0.20	0.3-0.35	50-75
Potassium	0.90	1.2-1.5	33-66

Cost-benefit ratio of micronutrient supplementation

“One calf per year” is a practically ideal metric that is traditionally used to track for the optimum reproductive performance in cows. To achieve this, a cow must successfully conceive within 90 days post-calving (i.e., 305 days of lactation + 60 days of dry period=365 days). If there is a miss of one heat or post-partum heat is delayed by one month or if cows fail to conceive after insemination, there will be additional cost of rearing, which is approximately INR 4,500 per cow and loss will be even more on using sexed semen, which is expensive. Therefore, when micronutrients are supplemented regularly, they act as an “investment” for better farm returns vis-à-vis treatment for infertility at later days that may represent an “expense”. In this regard, Table 6 presents some of the common mineral mixture supplements available for ruminant feeding in India. While complete mineral mixtures are included at 1-2%, the inclusion of trace minerals is generally low at 0.1-0.2% in the concentrate mixture. Alternatively, these can be fed as on-top supplements at 50-100 g or 5-10 g/cow on a daily basis.

Table 6. Micronutrient supplements available in Indian market for dairy animals

Brand Name	Manufacturer
Complete mineral/micronutrient mixture	
Agrimin Forte	Virbac India
Bestmin Gold	Cargill India
Kemtrace	Kemin Industries
Rovimix	DSM-FIRMENICH
GouMix	Indian Immunologicals Ltd.
Samridhi	Carus Laboratories Pvt. Ltd.
Ventrimix	Venkateshwara B.V. Biocorp.
Minfa Gold	Intas Pharmaceuticals
TANUVAS-Smart	TANUVAS, Tamil Nadu, India
GADVASU min. mix. (Type-II)	GADVASU, Punjab, India
Trace mineral mixture	
Bioplex	Alltech
Mintrex	Novus International Inc.
Availa-4	Zinpro
Optimin	Trouw Nutrition India
Avimin	Avitech Nutrition Pvt. Ltd.

Conclusion

Micronutrients play an important role in ameliorating infertility and thereby improving reproductive performance of dairy animals. With optimum production and reproduction, dairy operations become more efficient, financially lucrative and sustainable, for which a careful dietary consideration on micronutrients becomes essential.

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Environmental Metabolomics: An Emerging Subclass of Metabolomics studies in Fisheries and Aquaculture

*Samikshya Mishra¹ and Sujata Sahoo¹

Introduction

The rapid advancement of metabolomics has revolutionized our understanding of biological systems by providing comprehensive insights into the dynamic metabolic processes that occur within living organisms. Metabolomics, as a powerful tool in systems biology, has primarily focused on studying endogenous metabolites within the context of human health, disease, and essential cellular functions. However, as we increasingly recognize the intricate interplay between organisms and their environment, a new branch of metabolomics has emerged - environmental metabolomics. Environmental metabolomics is a rapidly developing field that focuses on the study of the biochemical processes and metabolites within organisms in response to environmental changes. It involves the systematic identification and quantification of small molecule metabolites present in biological samples, including tissues, bodily fluids, and environmental samples, using advanced analytical techniques such as nuclear magnetic resonance (NMR) and mass spectrometry (MS).

Environmental metabolomics seeks to unravel the complex interactions between organisms and their surrounding environment by investigating the diverse array of metabolites present in ecological systems. It encompasses the study of metabolites in ecosystems, such as soil, water, air, and plants, as well as the interaction between these environmental factors and living organisms, including humans, animals, and microorganisms. Integrating environmental metabolomics with other omics approaches, such as transcriptomics and proteomics, offers a holistic understanding of how organisms respond and adapt to environmental challenges. By providing a detailed snapshot of the metabolome, environmental metabolomics enables identifying key biomarkers, elucidating metabolic pathways, and assessing ecosystem health.

This emerging field holds significant promise for diverse

applications, including environmental monitoring, pollution assessment, agricultural sustainability, climate change studies, and drug discovery from natural sources. Environmental metabolome analysis can provide significant insights into the impact of environmental conditions on the physiology and ecology of species, allowing researchers to make more knowledgeable decisions about environmental management and conservation.

Environmental Metabolomics workflow

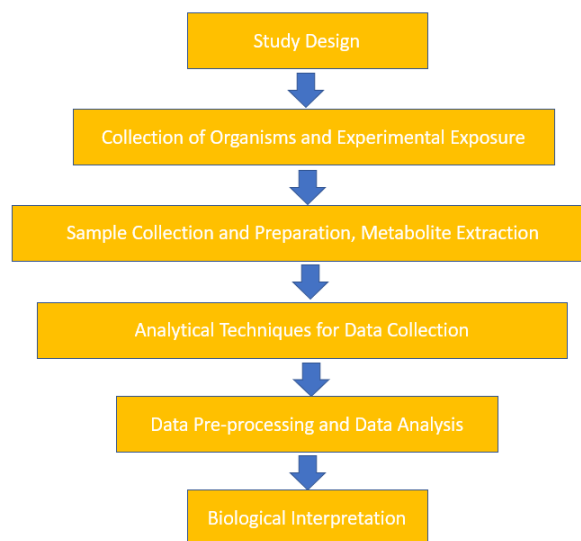


Figure: Environmental metabolomics workflow

1. Study Design:

- Select the appropriate organism relevant to the research question and represents the environment of interest.
- Consider the choice of the stressor(s) based on the environmental conditions being studied.

2. Collection of Organisms and Experimental Exposure:

- Decide whether the study will be conducted in the field or a controlled laboratory setting.

- Collect organisms from the environment or cultivate them under regulated conditions.
- Plan the number of exposures, control/reference sites, and stressor concentrations.

3. Sample Collection, Sample Preparation, and Metabolite Extraction:

- Determine the biological sample type to be analyzed (e.g., tissues, bodily fluids).
- Follow standardized protocols for sample collection, including freezing in liquid nitrogen and maintaining cold storage.
- Choose appropriate metabolite extraction methods based on the biological matrix.
- Consider additional steps such as sonication and centrifugation to enhance extraction efficiency.

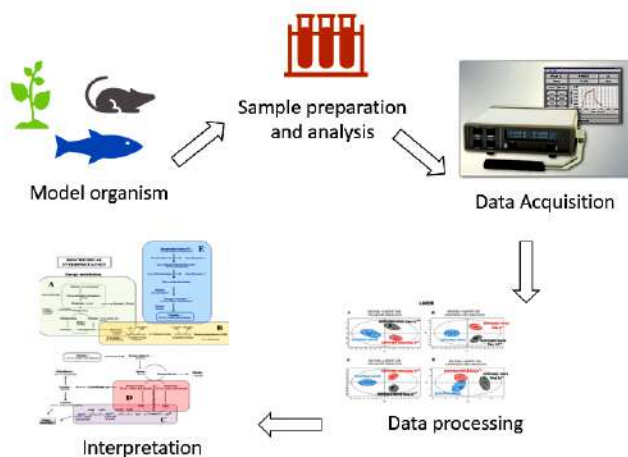


Figure 2: Representative workflow of environmental metabolomics.

4. Analytical Techniques for Data Collection:

- Utilize advanced analytical techniques such as mass spectrometry (MS) and nuclear magnetic resonance (NMR) spectroscopy.
- Connect MS to liquid chromatography, gas chromatography, or capillary electrophoresis for analyte separation.
- Employ 1D proton NMR spectroscopy for metabolite identification and structural elucidation.

5. Raw Data Pre-processing and Data Analysis:

- Perform pre-processing of raw data, including noise removal, baseline correction, and alignment.

- Apply statistical methods such as principal component analysis (PCA) to identify trends and variations in metabolic profiles.

- Utilize univariate and multivariate analysis techniques to analyze complex study designs and sampling frames.

6. Biological Interpretation of the Results:

- Use online databases like the Kyoto Encyclopedia of Genes and Genomes (KEGG) to explore metabolic pathways and specific metabolites.
- Employ tools like Metabo Analyst for pathway analysis, enrichment analysis, and visualization of metabolic networks.
- Interpret the results in the context of the research question and conclude the metabolic responses of aquatic organisms to environmental stressors.

Application of environmental Metabolomics in Fisheries and Aquaculture

In the context of fisheries and aquaculture, environmental metabolomics can provide valuable insights into the metabolic responses of aquatic organisms to various environmental stressors, including changes in water temperature, salinity, pH, and pollutants. By understanding the metabolic pathways and mechanisms underlying these responses, researchers can develop new strategies to improve the health and productivity of fish and other aquatic organisms, and to mitigate the negative impacts of environmental stressors. Some of the critical points of environmental metabolomics in fisheries and aquaculture include the identification of biomarkers for stress and disease, the assessment of environmental contamination and its effects on aquatic organisms, and optimizing feed and nutrition strategies for fish and other aquatic organisms. Additionally, environmental metabolomics can contribute to sustainable aquaculture practices by better understanding the metabolic processes involved in aquatic organisms' growth, reproduction, and survival in different environments.

The application of environmental metabolomics in aquaculture systems holds immense potential for advancing the sustainable development and management of this vital industry. Through identifying key metabolites and pathways, aquaculturists can gain valuable insights into the nutritional requirements, growth rates, and overall health of farmed organisms, leading to optimized feeding strategies, enhanced

disease detection and prevention, and improved environmental sustainability.

Environmental Stressors and Adaptation: Metabolomics has been used to study the impact of environmental stressors such as pollution, temperature changes, and hypoxia on fish and aquaculture species. By analyzing the metabolic profiles of these organisms, researchers have identified specific metabolites associated with stress responses and physiological adaptations. Little is known about the metabolic response of marine organisms, especially bivalves, to the combined effects of heat and hypoxia. In a study, Hu et al., 2022 employed widely targeted metabolomic analysis to study the metabolic response of gills in hard clams. A total of 810 metabolites were identified. The high content of oxidized lipids implied that organisms were under ROS stress. This information can be valuable for understanding the resilience and vulnerability of species to environmental changes.

Biomarker Discovery: Metabolomics offers a powerful approach for identifying biomarkers that can serve as indicators of environmental conditions and health status in fish and aquaculture systems. Researchers have identified specific metabolites or metabolic pathways associated with disease, pollution, or nutritional status by comparing the metabolic profiles of healthy and diseased individuals or those exposed to different environmental conditions. Porto et al., 2023 showed that zebrafish (*Danio rerio*) presents itself as a flexible and straightforward option to expect that NMR-based metabolomics in conjunction with statistical analysis will help researchers identify and validate biomarkers through precise diagnosis. These biomarkers can be used for early detection of diseases, monitoring environmental quality, and optimizing aquaculture practices.

Nutritional Assessment: Metabolomics has been applied to evaluate the nutritional quality and composition of feed ingredients used in aquaculture. Researchers can optimize feed formulations to enhance growth, health, and feed conversion efficiency by analyzing the metabolic profiles of different feeds and their effects on fish metabolism. Casu et al., 2017 employed principal component analysis (PCA) to assess the metabolic profiles in the liver, muscle, and plasma tissues and NMR spectroscopy-based metabolomics to examine the metabolic impacts of four commercial soy-based protein products on red drum fish (*Sciaenops ocellatus*). In this study, soy-fed fish showed a distinctive metabolic signature with elevated protein and lipid catabolism. This

approach also helps understand the metabolic requirements of different fish species and develop tailored diets for specific nutritional needs.

Aquatic Ecosystem Monitoring: Environmental metabolomics can provide valuable insights into aquatic ecosystems' metabolic interactions and ecological dynamics. By analyzing the metabolic profiles of different organisms and their responses to environmental changes, researchers can assess ecosystem health, identify critical metabolic pathways, and understand the impact of disturbances such as pollution or climate change on the overall ecosystem functioning. According to Goode et al., 2020, the study of metabolomic profiling as a new bioindicator of habitat quality for juvenile snapper (*Chrysophrys auratus*), he discovered that fish development measured using otolith increments was not indicative of the turbidity gradient with minimal discriminating between locations. However, the ability to distinguish fish from harbors with varying turbidity was made possible by the excellent sensitivity and 100 percent accuracy of metabolomic profiling.

Drug and Chemical Exposure: Metabolomics has been used to study the effects of pharmaceuticals, pesticides, and other chemical contaminants on fish and aquaculture organisms. By analyzing the metabolic profiles, researchers can identify specific biomarkers of exposure or toxicity, assess the sub-lethal effects of chemicals, and evaluate the efficacy of remediation strategies. The pollutant effect on fish was shown by Viant et al., 2006 who used NMR and HPLC-UV-based metabolomics to investigate the effects of three pesticides (dinoseb, diazinon, and esfenvalerate) on eyed eggs and alevins of Chinook salmon (*Oncorhynchus tshawytscha*). On eggs and alevins, dose-responsive effects were seen, with each pesticide causing particular biochemical reactions.

Overall, environmental metabolomics has provided valuable insights into the physiological responses, health status, and ecological interactions of fish and aquaculture species about their environment. This knowledge can contribute to developing sustainable fisheries and aquaculture practices and aid in assessing and managing aquatic ecosystems.

The goals of environmental metabolomics in aquaculture and fisheries

- Investigate the metabolic responses of aquaculture species to different environmental conditions.
- Identify biomarkers of health, stress, and disease in

aquaculture organisms.

- Optimize feed formulations by understanding the nutritional requirements and metabolic responses of aquaculture species.
- Assess the impacts of pollutants, chemicals, and other stressors on the metabolism of aquaculture organisms.
- Improve the efficiency and sustainability of aquaculture practices through targeted metabolic profiling.
- Enhance the understanding of metabolic interactions and ecological dynamics within aquaculture systems.
- Develop strategies for early detection, prevention, and management of diseases in aquaculture.
- Contribute to the development of environmentally friendly and sustainable aquaculture practices.

In fisheries and aquaculture, environmental metabolomics has been applied to investigate various aspects of the health, physiology and ecology of aquatic organisms. Here are some critical areas of research and findings in environmental metabolomics in fisheries and aquaculture:

Conclusion

Environmental metabolomics has emerged as a powerful tool in fisheries research, providing valuable insights into aquatic organisms' biochemical processes and responses to

environmental changes. Through analyzing metabolites, researchers have investigated various aspects related to the health, physiology, and ecology of fish and other species in aquaculture systems. The application of metabolomics in fisheries has allowed for the identification of biomarkers that serve as indicators of environmental conditions, health status, and nutritional needs of aquatic organisms. This information can be crucial for early detection and monitoring of diseases, optimizing feed formulations, and evaluating the impacts of environmental stressors such as pollution and climate change. By understanding the metabolic pathways and responses of fish to different stressors, researchers can develop strategies to enhance resilience and mitigate the negative impacts on fisheries. Overall, environmental metabolomics in fisheries holds great promise for advancing our understanding of the complex relationships between aquatic organisms and their environment. This knowledge can support the development of sustainable fisheries practices, aid in conserving and managing fish populations, and contribute to preserving aquatic ecosystems for future generations.

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Detecting unwanted elements and frequent adulterants of feed qualitatively

Rashmi Kumari¹, Dinesh Kumar^{2*}, N. Upadhyay³, P. K. Yadav⁴ and Brishketu Kumar⁵

The efficiency of feed utilization in the livestock and poultry birds and the development of the feed industry of a country are dependent upon the quality of feeds. The quality of compound animal feeds is based on the quality of its constituents i.e. the raw material (cereals, cereals by product, oilseed meals, marine feeds, agro-industrial by-products) used to formulate the ratio. Feed quality has been defined as “any of the features that make something what it is” and “the degree of excellence which a thing possesses”. A Quality feed would supply all nutrients in adequate quantity and high digestibility and ingestibility value.

In India the quality control is regulated by a statutory body Bureau of Indian standard (BIS). It was established under the BIS act in 1986. Earlier the Indian Standards Institute was regulating the quality control of various feed commodities.

The objectives of BIS are follows:

1. Harmonious development of the activities for standardization of various commodities.
2. Marking
3. Quality certification of goods
4. Attending to the connected methods

The objective of quality control of feedstuff is to ensure that a consumer should obtain feeds that are unadulterated, true to their nature and produce desired results. Quality control is therefore defined as the maintenance of quality at levels and tolerance acceptable to the buyer while minimizing the cost of processing.

The objectives to constitute the sectional committees are:

1. To describe the feeds accurately
2. To lay down standards on feed ingredients
3. To lay down standards for compound feed formulation and mineral mixture for cattle, poultry, pigs, and

laboratory animals, etc.

A. Quality control of raw materials

Quality control of raw materials that are feed ingredients in the first state to be done to ensure that they meet the minimum contract specifications that they are suitable for inclusion in the compound feed and also to indicate the maximum proportion in which they can be included.

1. Preliminary inspection of raw materials

A thorough physical inspection for the following is to be done when they are received at the mill

- ✓ Colour, odour, texture, density of the material
- ✓ Evidence of wetting
- ✓ Presence of adulterant such as stone, dirt or other foreign materials
- ✓ Storage pests
- ✓ Evidence of damaged or broken kernels
- ✓ Evidence of presence of rat faecal pellet or hair
- ✓ Moisture should not be more than 10% (determine the moisture of the feed rapidly)

2. Chemical test: Proximate analysis of feed

3. Toxicological test: Detection of anti-nutritional factor by different lab methods.

B. Finished feed quality

Common adulterant in feeds and fodders:

Adulteration is defined as the admixture of a pure substance with some cheaper and low quality substances. It is done intentionally usually to make money. In costly feed ingredients like oil seed cake and feeds of animal origin like fish meal, adulteration is done by spraying urea in order to raise their protein content. However sometimes bran, molasses are also added. Beside urea, oil seed cakes are adulterated with husk and non edible oil seed cakes.

Table 1. Common adulterants of different feed ingredients

S.No.	Feed ingredients	Adulterants
1	Groundnut cake	Groundnut husk, urea, non edible oil cakes
2	Mustard cake	Argimona mexicana seeds, fibrous feed ingredients, urea
3	Soybean meal	Urea, raw soybean
4	De-oiled rice bran, wheat bran	Ground rice husk, saw dust
5	Fish meal	Common salt, urea, sand
6	Mineral mixture	Common salt, marble powder, sand, limestone
7	Molasses	Water
8	Maize	Cobs
9	Rice kani	Marble, grit

Quality control of feeds and feed ingredients

Quality control specification of various feed ingredients and compound feeds laid down by BIS ensure to meet the minimum contract specification, suitable for inclusion in the compounded feeds and indicating the maximum proportion of inclusion of feedstuff.

Sampling of feeds: In India BIS has laid down the following procedure and precautions for collecting the samples for analysis.

General requirements:

1. In drawing, preparing, storing and handling samples, care should be taken that the properties of feeds are not affected.
2. Take samples at a protected place not exposed to damp air, dust or soot.
3. The sampling instrument shall be clean, dry and sterile when used.
4. Protect the samples, the sampling instrument and the containers for samples from adventitious contamination.
5. Preserve the sample in clean, dry and sterile container. The sample containers shall be of such a size that they are almost completely filled by the sample.
6. Each container shall be shield air tight with a stopper or a suitable closer after filling in such a way that it is not possible to open and reseal it without detection. Market

full details of sampling i.e. the date of sampling, batch or code numbers, name of the manufacturer and other important particulars of the consignment.

7. Samples shall be stored in such a manner that there is no deterioration of the material.
8. Samples shall be done by in the presence of the purchaser (or his representative) and the vendor (or his representative).

Table 2. Quality control of feed ingredients

Ingredient Quality (Qualitative)	Physical characteristics: Colour, Texture, Odour and Test, Particle size (screen analysis), Shape, Adulteration, Damage and deterioration, bulk density, storage pests, faecal material, hair, spot chemical test
Ingredient Quality (Quantitative)	<p>Chemical analysis: Moisture, CP, CF, EE, NFE, Ash, Acid insoluble as (silica or sand), salts, free fatty acid, biogenic amines, urea, and NPN, amino acids.</p> <p>Anti nutritional factor :</p> <p>Extrinsic (contaminants): Mycotoxin, weeds, insecticide, herbicides, fungicides</p> <p>Intrinsic: Allergens, Lectins, phytosterogens, glucosinolates (rape seed) saponins, tannins, ricin, sinapine, gossypol (cotton seed cake), lipoxygenase, trypsin inhibitor, urea</p> <p>Decomposition and rancidity test: Acid value, peroxide value</p> <p>Protein quality: Protein solubility or dispersibility, Nitrogen solubility, Maillard reaction product, Dye binding, pepsin digestibility, amino acid digestibility.</p>

Evaluation of feeds for quality:

The feeds are usually subject to following three types of test

1. **Physical evaluation** - Colour, Size, Homogeneity, Smell, Taste, Touch, Sound
2. **Chemical evaluation** -
3. **Biological evaluation** - The biological evaluation of the feeds involved the use of animals, specialized persons to conduct the digestion and metabolism trial on the various species of lab animals and poultry. These methods are time consuming.

Table 3. BIS Specification for Compounded Feeds for Cattle

Characteristics	Cattle (Type I)	Cattle (Type- II)	Calf Starter	Calf Grower
Moisture Max %	11	11	11	10
Crude Protein Min %	22	20	23-26	22-25
Ether Extract Min %	4.0	3	4	4
Crude Fibre Max %	10	12	7	10
AIA Max %	2.5	3	2.5	3.5
Salt Max %	1	1	-	-
Calcium Min %	0.8	0.8	-	-
Available Phosphorous Min %	0.25	0.25	-	-
Urea Max %	1	1	-	-
Vitamin A (IU/Kg) Min	7000	7000	-	-
Vitamin D ₃ (IU/Kg) Min	1200	1200	-	-
Vitamin E (IU/Kg) Min	30	30	-	-
Aflatoxin B ₁ (ppb) Max	20	20	-	-
Cadmium (mg/kg) Max	0.5	0.5	-	-

Table 4. BIS Specification for Mineral Mixture Containing Salt (Type I) and Without Salt (Type II) For Cattle Feed

Parameter % By Mass	Type I (Salt)	Type II (Without Salt)
Moisture Max	5	5
Calcium Min	18	23
Phosphorus Min	9	12
Magnesium Min	5	6.5
Salt Min	22	-
Iron Min	0.4	0.5
Iodine (KI) Min	0.02	0.026
Copper Min	0.06	0.077
Manganese Min	0.1	0.12
Cobalt Min	0.009	0.012
Fluorine Max	0.05	0.07
Zinc Min	0.3	0.38
Sulphur Max	0.4	0.5
AIA Max	3	2.5

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ADVERTISERS INDEX

Allanasons Private Limited.....	58
ARCL Organics Ltd	88
Avanti Feeds Limited	83
Avitech Nutrition Pvt. Ltd.	76
Blueline Foods India Pvt. Ltd.	47
Evonik India Pvt. Ltd.	75
Fermenta Biotech Limited	37
Godrej Agrovet Limited	04
Godrej Tyson Food Ltd.	17
India Gelatine & Chemicals Ltd.	38
Intervet India Pvt. Ltd.	104
Kemin Industries South Asia Pvt. Ltd.....	29
Nanda Feeds Pvt. Ltd.	03

Natural Remedies Pvt. Ltd.	48
Neospark Drugs & Chemicals Pvt. Ltd.....	24
Noveltech Feeds Pvt. Ltd.	84
Novus Animal Nutrition (India) Pvt. Ltd.	103
Pranav Bitek Agrotech Pvt. Ltd.	102
S. A. Pharmachem Pvt. Ltd.	02
Sarawagi Agrovet Pvt. Ltd.	18
The Waterbase Limited	87
Trouw Nutrition India Pvt. Ltd.	101
Virbac Animal Health India Pvt. Ltd.	57
Zenex Animal Health India Private Ltd.	30
Zeus Biotech Pvt. Ltd.....	67
Zeus Biotech Pvt. Ltd.....	68

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17 36th IFIF General Assembly

At FAO Headquarters in Rome, Italy
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Email: alexandra.athayde@ifif.org
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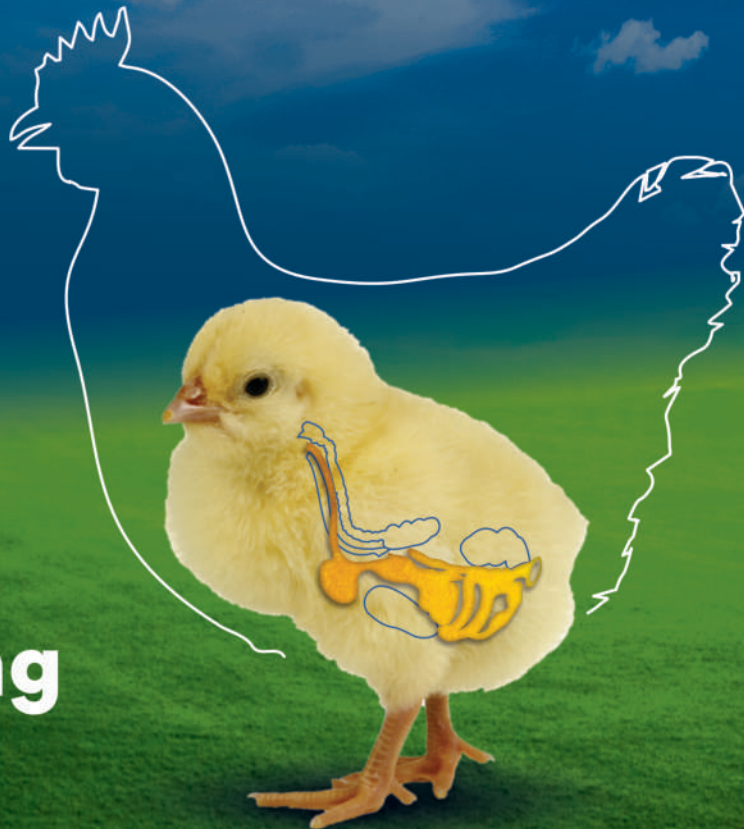
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