

Livestock & Feed Trends



VOLUME - 19 • NUMBER - 1 • APRIL - JUNE 2021

CLFMA WEBINARS

April 12, 2021 - Time : 5 pm to 6.30 pm

Online Panel Discussion on "Soybean and other Oilmeals Demand and Supply Outlook - Present & Future"

Industry Expert
Dr. Davish Jain
Chairman, SOPA

Industry Expert
Dr. B. V. Mehta
ED, SEA

Industry Expert
Mr. Bahadur Ali
Chairman, AIPBA

Industry Expert
Mr. B. Soundarajan
MD, Suguna Holdings

Industry Expert
Dr. B.M. Masthan Rao
Chairman, BMR Group

Industry Expert
Dr. P. Krishnaiah
IAS ret'd., advisor, Shrimp Feed Manufacturers Association

Moderator
Mr. Neeraj Kumar Srivastava
Chairman, CLFMA OF INDIA

Industry Expert
Dr. Dinesh Bhosale
RSD, AB Vista, SA

Vote of Thanks
Mr. Suresh Deora
Hon. Secretary, CLFMA OF INDIA

Host :
Ms. Chandrika Venkatesh,
ED, CLFMA OF INDIA

Online Registration Link :
<https://forms.gle/Q5C2aXzcVSHHJv7o6>

NCDEX in association with **CLFMA OF INDIA**

Webinar on Hedging price volatility of feed ingredients using commodity derivatives

WEBINAR HIGHLIGHTS

- Hedging practices in global & domestic markets
- Price risk management using commodity derivative tools
- Hedging mechanism - A case study

Date - 14th June 2021
Timings - 4:00 to 5:30 pm

SPEAKERS

Mr. Sumit Gupta
Business Head, South Asia & SE Asia, Mcdonald's

Mr. Rajib Saha
Manager Derivatives Trading, ITC ABD Ltd.

Mr. Kapil Dev
Chief Business Officer, NCDEX

Ms. Rajini Panicker
VP, Commodity Head-Phillip Capital India

Mr. Neeraj Srivastava
Chairman, CLFMA

Dr. Suresh Deora
Hon Secretary, CLFMA

Dr. Sujit Kulkarni
Moderator - MC Member, CLFMA

In case of any queries, feel free to Call us on toll-free 1800-266-2339 or leave a message at webinar@ncdex.com

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Secretary (Food & Public Distribution)
Min. of Consumer Affairs, Food and Public Distribution, Government of India

Smt. Shubha Thakur
Joint Secretary, Ministry of Agriculture, Cooperation & Farmers Welfare, Government of India

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From the Chairman's Desk.....

Dear Friends,

Greetings!

CLFMA of India, the apex organization and the voice of the country's dynamic livestock sector celebrated its **54th Birthday on 8th June 2021**.

We are striving hard for the betterment of the Livestock Sector as a whole amidst 2nd Wave of Covid' 19 Pandemic.

In the first quarter of new fiscal year 2021, we have made various representations to the GOI, also we had conducted Webinars & Meetings with GOI, and the same has been presented under the Heading **CLFMA Updates** in this issue for the month of April to June, 2021 to get detailed updates of all the CLFMA activities. Few, of the major CLFMA of India Events / Meetings viz. has been summarized below, where in Government participation was directly involved to solve CLFMA Members' problems on top priority. As always, I would like to thank the Animal Husbandry Ministry and other department like BIS, FSSAI & Commerce Ministry, as we are getting good support from GOI.

CLFMA of India has raised the voice for the Soyabean shortage issue with GOI, in the Interactive virtual meeting of Indian Livestock Key Stake Holders with Honourable Minister Dr. Sanjeev Balyan, Minister of State AHD&F, GOI and Dr. O. P. Chaudhary, JS, AHD&F, Govt. of India. We had a virtual meeting with NCDEX on the topic - Understanding price risk management using derivatives market.

In last year during lockdown Livestock sector suffered because of not classified as essential sector. This year proactively we followed up & on 3rd May, 2021, we got a **letter from Dr O.P. Chaudhary, JS, Ministry of Fisheries, AH&D, Dept. in which Government allowed Manufacture and Transportation of Animal Feed / Feed Ingredients and Fodder under the essential services**, so that Livestock sector may not suffer from feed shortages.

I would like to extend huge thanks to **Hon'ble Minister Shri. Giriraj Singh and Hon'ble Minister Dr.Sanjeev Kumar Balyan for responding very positively to the Representation of All India Breeders' Association (Ref. 2nd April) & CLFMA OF INDIA (Ref. meeting held on 23rd April).**

As a result of above on 11th May, **Ministry of Animal Husbandry, Dairying and Fisheries issued Office Memorandum with recommendation to Ministry of Commerce and Industry to allow 1.2 Million MT Soybean Meal duty free import to help Livestock Industry.**

I have attended the meeting on 21st May 2021 arranged by invest India PLI with other key industry players in processing of both Poultry & Dairy presided by Shri Atul



Chaturvedi, Hon'ble Secretary AHD. We have circulated the PLI schemes to all members.

To help our members & to create awareness CLFMA in association with NCDEX successfully conducted a Webinar on **"Hedging Price Volatility of Feed Ingredients using Commodity Derivatives"** on Monday June 14, 2021 with 317 participants. Press Release has been circulated to all Members.

As CLFMA of India is actively engaged and partnered with other industry associations time to time, one of such event was jointly organised with **SEA - IOPEPC in association with SOMA on the Topic - "Wonder Nut - Groundnut"** - Prosperity through Productivity on Saturday, June 19th, 2021 with an active participation of 522 audience across Asia.

More webinars are there in the pipeline for coming months on burning issues of the industry.

I am looking forward to your continued support and co-operation from time to time and solicit your valuable inputs and suggestions to further strengthen our association and help industry in a meaningful and value-added manner.

With Warm Regards,

Yours sincerely,

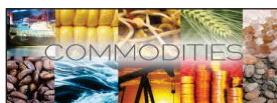
For CLFMA OF INDIA,

Neeraj Kumar Srivastava
Chairman



05CHAIRMAN'S DESK

COMMODITY UPDATES..... 7



19CLFMA UPDATE

PRESS RELEASE..... 27



GENERAL..... 45-49



50-52GENERAL

DAIRY.....

55-57



58-60GENERAL

CALENDAR OF EVENTS..... 61



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Commodity Updates

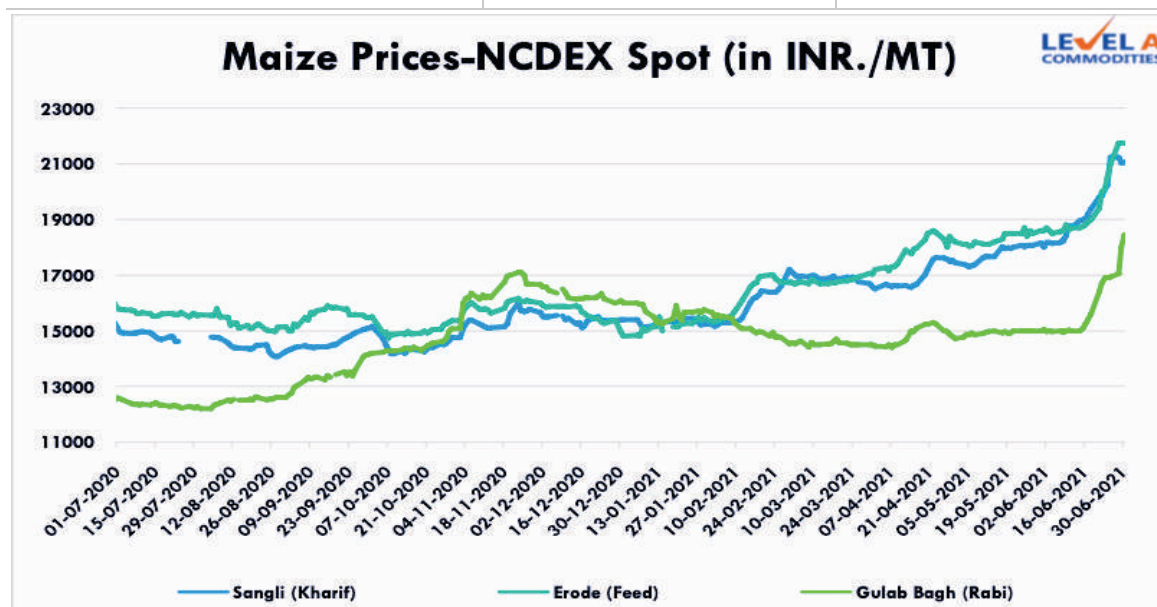


Index

1. [Domestic Prices](#)
 - I. [Maize](#)
 - II. [Soy meal](#)
 - III. [Egg rates](#)
 - IV. [Broiler rates](#)
2. [Trade Details](#)
3. [Market Updates](#)
4. [Market Drivers](#)

Domestic Prices in INR/MT:
Maize NCDEX Spot Price (in INR/MT.):

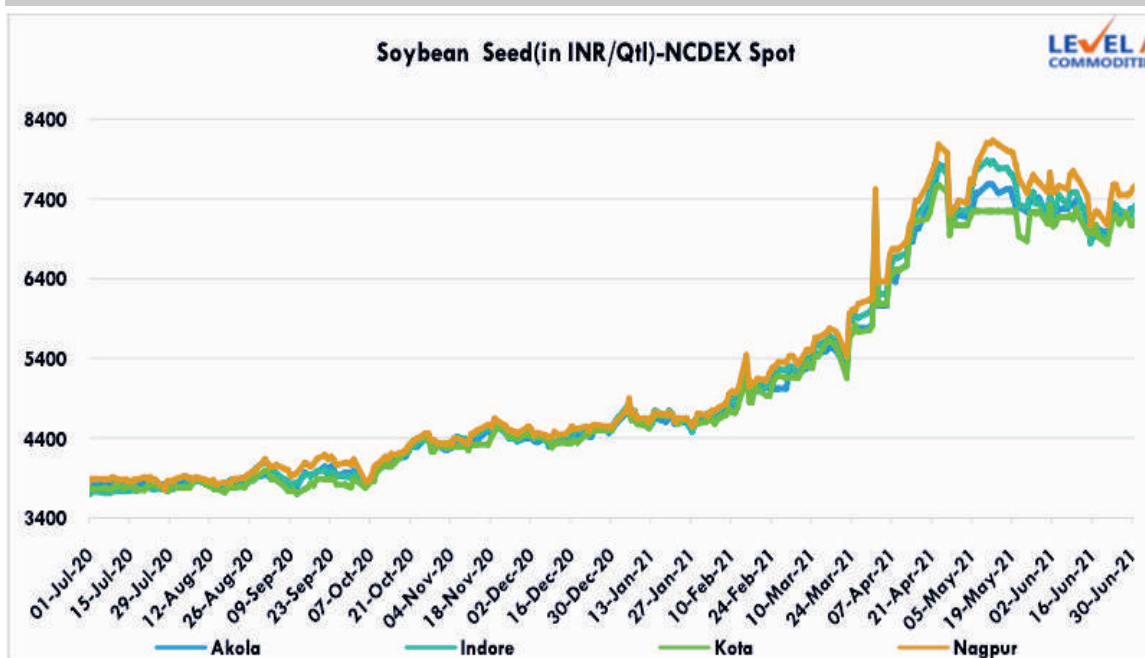
Location	30-June-21	31-May-21
Gulab Bagh (Rabi)	18450	15000
Sangli (Kharif)	21050	18160
Erode (Feed)	21750	18600



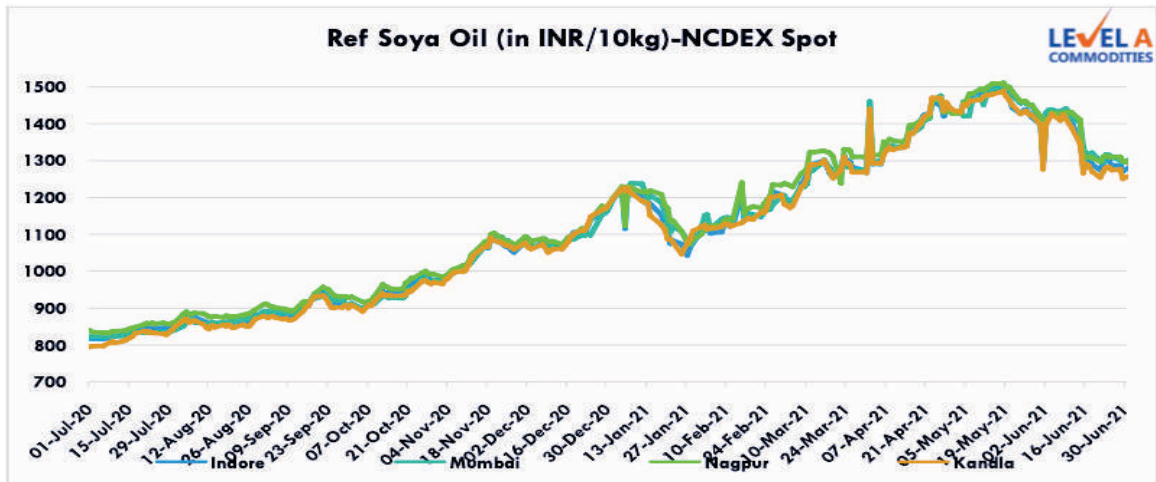
Soybean:
Soybean Complex Prices-NCDEX Spot:

Commodity (Unit)	Location	30-June-21	31-May-21
Ref Soya Oil (in INR/10kg)	Kandla	1,257	1,397
	Indore	1,279	1,398
	Mumbai	1,302	1,400
	Nagpur	1,291	1,420
Soybean Seed(in INR/Qtl)	Akola	7,310	7,196
	Indore	7,325	7,227
	Kota	7,171	7,093
	Nagpur	7,575	7,487
Soymeal (in INR/MT)	Indore	62,375	60,000

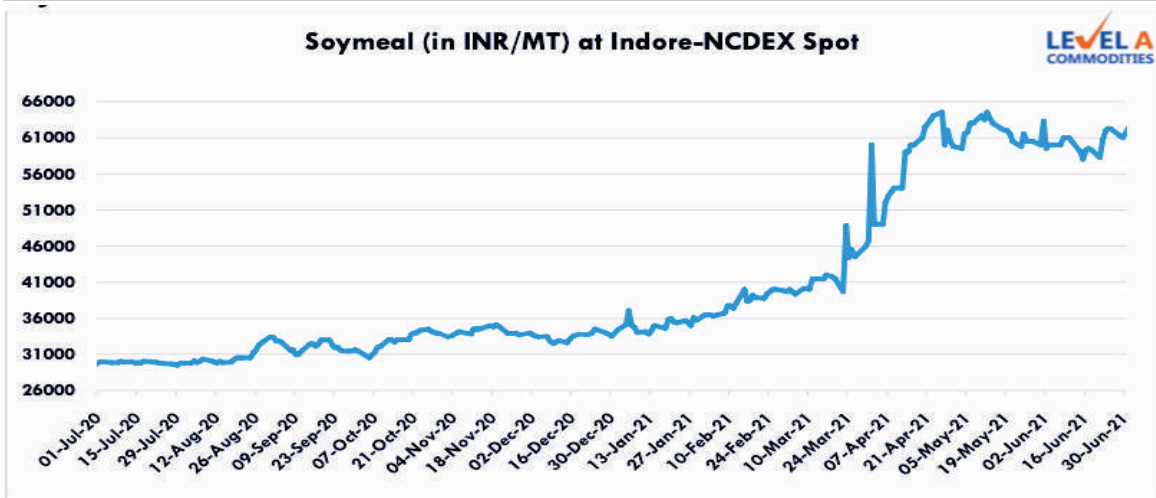
Soybean Seed



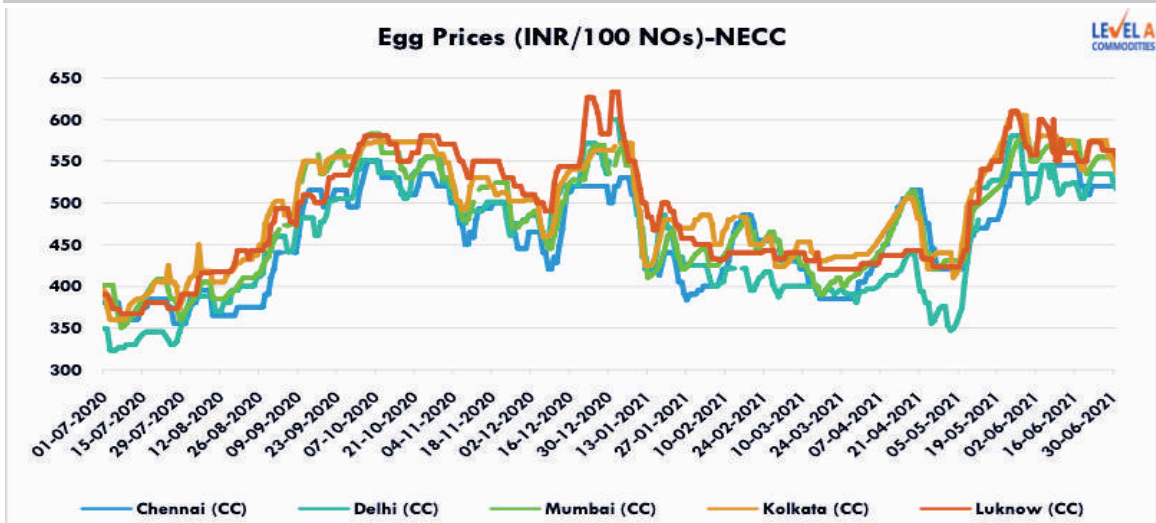
Soya Oil



Soymeal Prices-NCDEX Spot:



Egg Prices



Egg Rates		
NECC Prices		
Market	30-June-21	31-May-21
Ahmedabad	556	545
Ajmer	507	485
Asansole	-	-
Barwala	500	482
Banglore (CC)	525	545
Brahmapur (OD)	493	510
Burdwan (CC)	-	-
Chennai (CC)	520	535
Chittoor	513	528
Delhi (CC)	520	504
E.Godavari	498	500
Hyderabad	500	490
Ludhiana	501	482
Midnapur (KOL)	-	-
Mumbai (CC)	-	550
Muzaffarpur (CC)	548	538
Mysuru	520	547
Nagpur	540	530
Namakkal	505	505
Patna	543	538
Pune	553	545
Ranchi(CC)	557	548
Vijayawada	508	510
Vizag	515	557
West Godavari	498	500
Warangal	502	492

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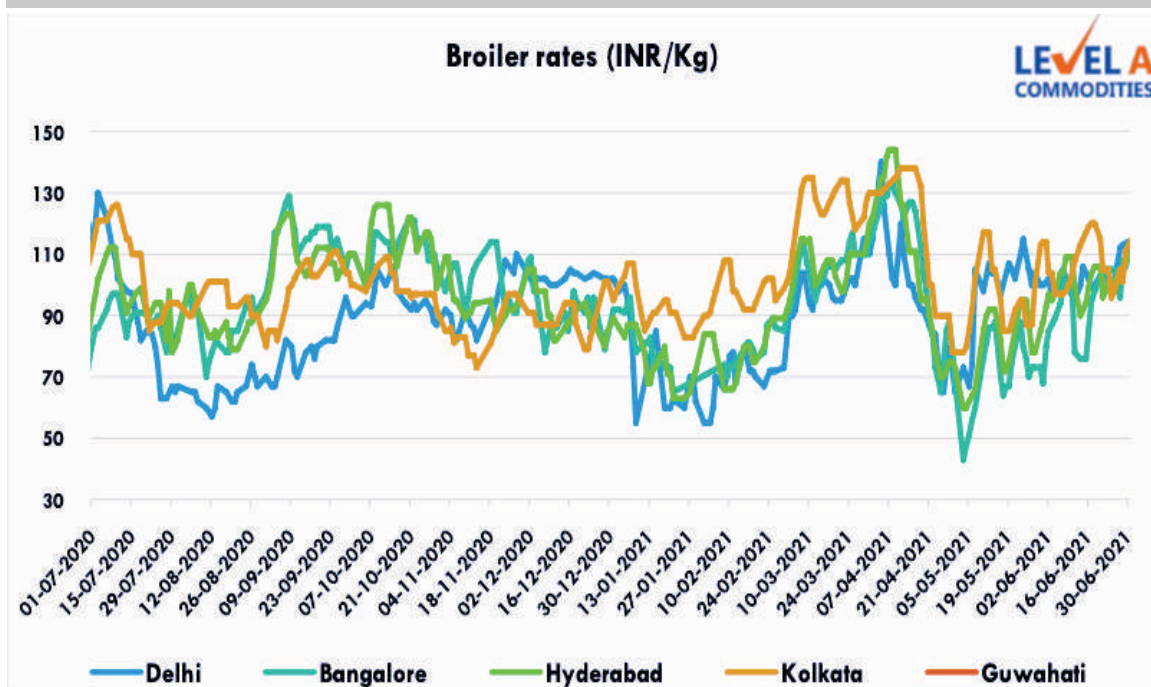
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Prevailing Prices

Market	30-June-21	31-May-21
Allahabad (CC)	543	548
Bhopal	535	-
Hospet	485	505
Indore(CC)	535	-
Jabalpur	532	-
Kanpur (CC)	552	514
Kolkata (CC)	545	560
Lucknow (CC)	563	557
Raipur	540	-
Surat	566	550
Varanasi (CC)	560	557

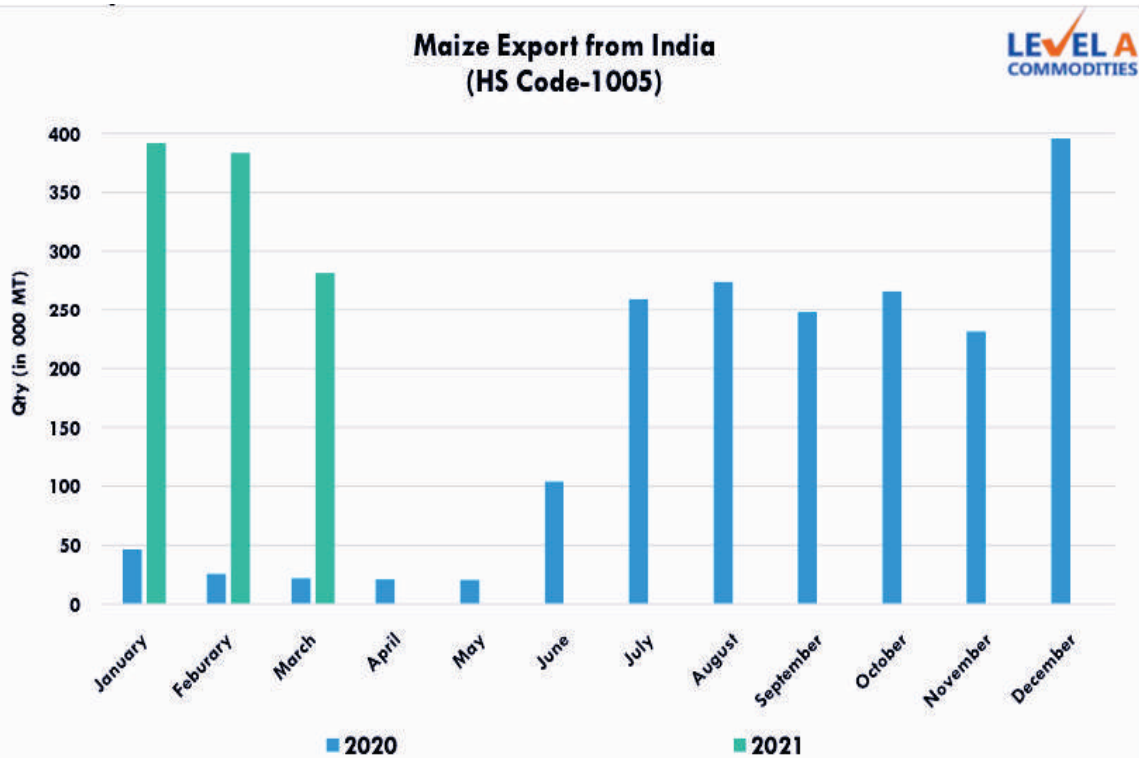
Broiler Rates



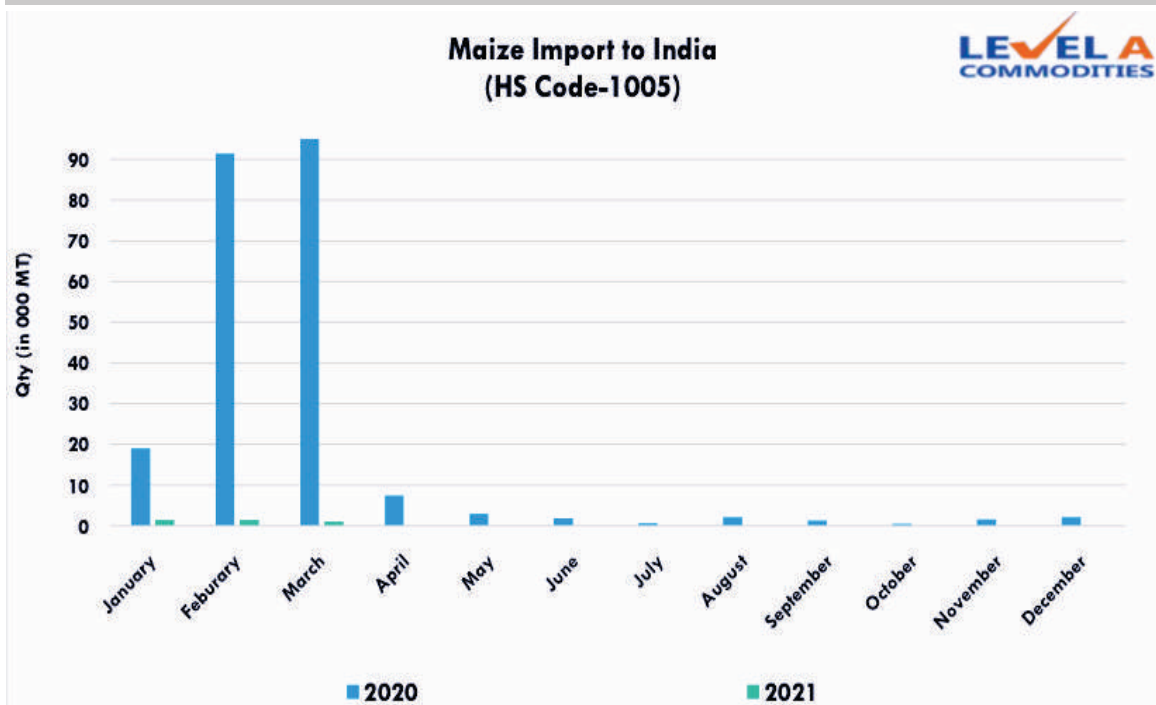
Broiler rates (INR/Kg)		
Market	30-June-21	31-May-21
Delhi	114	100
Punjab	116	92
Raipur	112	85
Pune	112	95
Bangalore	111	68
Hyderabad	109	88
Gujarat	128	106
Kolkata	113	114
Lucknow	114	131
Guwahati	-	-
Chicks Price (INR/Unit)		
Market	30-June-21	31-May-21
Punjab	17	34
Chandigarh	17	34
Haryana	17	34
Himachal Pradesh	18	35
Rajasthan	18	35
Jammu & Kashmir	18	35
Uttarakhand	17	35
Uttar Pradesh	20	42
Madhya Pradesh	-	-
Chhattisgarh	-	-
Bihar	23	41
Jharkhand	23	38

Trade Details

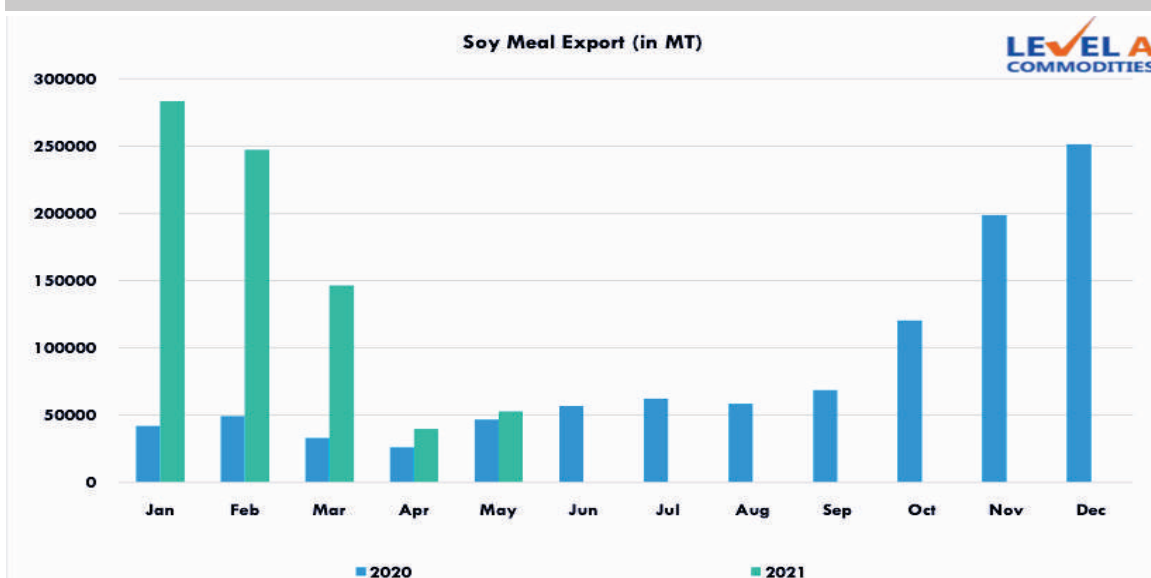
Maize Export from India



Maize Import to India



Soy Meal Export from India(In MT)



Market Drivers

Maize

Market Drivers	Monthly Outlook
Maize cash markets trend during the month of June 2021 was strong as compared to previous month	Bullish
Sowing of Kharif Maize started	Bullish
Export demand is strong, would support the market	Bullish
USDA decreased its World Maize Ending Stock Estimate	Bullish

Soymeal

Market Drivers	Monthly Outlook
Soybean and soymeal inclined at various trading centres amid mixed pace of supplies	Bullish
Weak domestic and international market sentiments may put more pressure in oilseeds segments in coming weeks	Bullish
Soyoil retail price increased 35% so far compared to last year	Bullish
2021/22 global oilseed supply and demand forecasts include higher production and ending stocks compared to last month	Bullish

Disclaimer: The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

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95% of choline pool in the animal body is only in the form of phosphatidyl choline - It means, in animal body dietary choline, gets converted in the form of phosphatidyl choline (PC) (Li and Vance, 2008).

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On 8th April 2021 representations were given for inclusion of "Animal Feed Manufacturing and Animal Feed Distribution" as essential services in 'Break the Chain' for transmission of Covid-19 in Maharashtra State to Shri. Uddhav Thackeray, Hon'ble. Chief Minister of Maharashtra State, Shri. Ajit Dada Pawar, Hon'ble Dy. Chief Minister of Maharashtra, Shri. Sunil Chhatrapal Kedar, Hon'ble Minister, AH, DD & FD, GOM Shri. Dattatray Vithoba Bharane, Hon'ble Minister for State, Textiles, AH, DD & FD, GOM & Shri. Atul Chaturvedi, Secretary AH & D, Dept. of AH&D, GOI.

After that on 10th April, 2021, the Department of Animal husbandry & Dairying had consulted CLFMA OF INDIA to give comments about a proposal, which the Government had received to export Rice Bran Hi-fat quality from India, for which, CLFMA OF INDIA requested the Government not to allow exports of Rice Bran from India, as the farmers and feed millers of Cattle and Fish sector will be affected badly. This representation was given to Dr. O. P. Chaudhary, Joint Secretary (NLM), Dept of AH&D and Mr. Vijay Thakre, Assistt. Commissioner (Feed & Fodder), Feed & Fodder Unit (NLM Division), Dept of AH&D, Government of India,

On 12th April, 2021, CLFMA OF INDIA conducted an "Online Panel Discussion on Soybean and other Oil-meals Demand and Supply Outlook- Present & Future". A Press release was given in the print media. Also, the online discussion was live on Facebook and YouTube. The main objective was to discuss the prevailing raw material situation of Soybean in India as there was a sudden spurt in the prices of the soybean and soymeal, as it is the main ingredient of animal feed. The other purpose of this seminar was to provide a platform, which encourages all poultry industry and other livestock industry players to show solidarity for representing to the government in all matters.

The panellists present for the discussion were Dr. Davish Jain, Chairman, Soybean Processors' Association of India (SOPA), Dr. B. V. Mehta, Executive Director, Solvent Extractors' Association of India, Mr. Bahadur Ali – IB Group and President of All India Poultry Breeders Association (AIPBA), Mr. B. Soundararajan - MD, Suguna Holdings and Former Chairman of CLFMA OF INDIA, Dr. B. M. Masthan Rao, Chairman, BMR Group, Dr. P. Krishnaiah, IAS (Retd.), Advisor, Shrimp Feed Manufacturers Association and Dr. Dinesh Bhosale – Regional Sales Director, AB Vista South Asia and Former Chairman of CLFMA OF INDIA.

The action points arrived out of this discussion as follows:

- Govt. statistics shows that, there is 30 lakh ton of soya availability for the feed industry and the largest consumers are poultry and aqua sector in the industry;
- The prices of Soya have gone up by 50% and the biggest culprit for this price increase is speculation by the NCDEX and is fuelled by social media, to ease this we should ask the govt. to allow import of smaller quantities of Soymeal to bring the sentiment down and cool the market;
- The panic buying should be discouraged;
- We have to approach the Govt. collectively on all these issues;
- We have to approach jointly to SEBI for the purpose of regulating the NCDEX from doing excessive speculations

Further developments about the Soya Issue are given below:

On 15th April, 2021, CLFMA of India attended the stakeholders meeting with regard to the discussion of the "Draft of Prevention of Cruelty to Animal Bill, 2021". The meeting was presided by Dr. Sujit K. Dutta, Secretary, Animal Welfare Board of India, Faridabad, Haryana & Joint Commissioner, Dept. of Animal Husbandry & Dairying. As per the Government's request the presentation has been circulated to all the CLFMA Members for Comments. The comments received from CLFMA members have been forwarded to the concerned government authorities.

On April 21, 2021, CLFMA OF INDIA gave a representation to Securities Exchange Board of India (SEBI) Chairman Shri. Ajay Tyagi, with a CC to Shri. V. S. Sundaresan, Executive Director- Commodity Derivatives, Securities Exchange Board of India (SEBI) Market Regulation Department, requesting to regulate the excessive speculation of Soyabean trading by NCDEX, due to which, the major raw material (Soybean) prices has increased sharply affecting the livestock Industry (Poultry, Cattle, Aqua), which caters to the livelihood (provides employment) to about 8.8 % of the population in India.

On 23rd April 2021, CLFMA OF INDIA actively participated in the Interactive virtual Meeting of Indian Livestock Key Stake

Holders with Hon'ble Minister Dr. Sanjeev Balyan, Minister of State AHD & F and Dr. O. P. Chaudhary, JS, (NLM), Dept of AH&D, GOI. Key stakeholders who attended the meeting were Mr. Neeraj Kumar Srivastava, Chairman, CLFMA, Mr. Bahadur Ali- MD of IB Group (Rajnandgaon, Central India), Mr. Gulrez Alam- Director, IB Group (Rajnandgaon, Central India), Mr. G. B. Sondararajan- MD of Suguna Group (Coimbatore, Tamilnadu), Dr. Sandeep Karkhanis- MD of Noveltech Feeds India (Mumbai), Mr. Gopal Reddy – Director, Sneha Farms (Hyderabad), Mr. Sumit Surekha- MD, Shivshakti Agro (Kolkata), Mr. Amit Saraogi – MD of Anmol Feeds (Kolkata), Mr. Sameer Agarwal- MD of Shalimar Group (Kolkata), Dr. Saurabh Shekhar – MD, Nutreco India and Dr. Sujit Kulkarni – Director (Feed Additives) Nutreco India, MC member CLFMA.

The main highlights of this meeting were:-

- On Thursday 22nd April 2021, Soyabean delivery of the month ended at Rs. 7,410 a quintal, while May and June futures closed at Rs. 7,172 and Rs. 7,070, respectively. NCDEX spot Soyabean (Indore delivery) was quoted at Rs. 7,070 a quintal.
- Particularly on NCDEX, soybean futures have been hitting the upper ceiling of six per cent over the last few sessions resulting in CLFMA OF INDIA seeking Government action.
- The reason cited for this increase by players in the futures market is non-availability of Soyabean stocks.
- Unprecedented bull run was noted in NCDEX Soyabean futures. Market were rigged by speculators, with daily upper circuit. Unsupported by demand-supply fundamentals. Irrational prices disrupting physical trade were noticed. Stakeholders requested immediate stern steps to check Soyabean futures rigging."
- The abnormal rise in Soyabean futures has resulted in poultry and aquaculture sectors protesting against the increase in soymeal prices. Especially, the poultry sector, has been demanding that it be allowed to import 12 lakh tonnes of Soyameal duty-free to tame the rising prices. It has also sought to bring in soymeal derived from GMO (genetically-modifies Soyabean).
- Both these demands are unlikely to be met, according to industry sources, who said that, the poultry and

aqua sectors demand can be met from within the country without any problem.

- The futures market is in the grip of speculators, which is directly affecting physical trade. The current bull-run on NCDEX is irrational as it is without any fundamentals. We have ample stocks of Soyabean in the country.

In pursuant of the above interaction with key stakeholders of Livestock industry and as per commitment by the Hon'ble Minister Shri. Dr. Sanjeev Balyan (State Minister AHD&F), held a meeting with the Hon'ble Cabinet Minister Shri. Giriraj Singh (AHD&F), and Mr. Atul Chaturvedi, Secretary Dept. of AH&D. Both Ministers also had a word with the Hon'ble Minister Shri. Narendra Singh Tomar, Minister of Agriculture & Farmers Welfare, Govt. of India. Shri. Atul Chaturvedi communicated Commerce Secretary & Food Secretary to restrict future trading of NCDEX and take pre-emptive measures to prevent hoarding.

On 26th April 2021, first meeting of the subcommittee for preparation of guidelines of Registration and Certification of Antibiotic-free aquaculture inputs and to recommend penal action on detection of antibiotic residues in farms, hatcheries and aquaculture inputs was conducted by Coastal Authority of India (CAA), Chennai and this meeting was attended by Mr. Divya Kumar Gulati, Dy. Chairman, CLFMA OF INDIA, Dr. Shivaji Dey, Member of CLFMA OF INDIA and Mr. Ashok Kalyanam, Member of CLFMA OF INDIA. It was more of an introductory meeting among the sub-committee members. CLFMA OF INDIA has raised the issue of having a uniform guideline in ASPADA, FSSAI and CAA and suggested the same to the CAA Authorities.

On 26th April 2021 we had a virtual meeting with NCDEX on the topic - Understanding price risk management using derivatives market. The speakers of the session were Mr. Kapil Dev - Chief Business Officer, NCDEX, Mr. Arun Yadav - SVP – Products, NCDEX, Ms. Bhupalini Kodati - Senior Manager – Products. The Chairman welcomed the speakers and the participants. This was conducted only for MC members to understand, if this subject can be taken to the larger audience. Around 26 members including the past presidents attended the meeting. The vote of thanks was given by Ms. Chandrika Venkatesh, Executive Director, CLFMA OF INDIA and she summarized the meeting. The major highlights of the meeting are as follows:-

- Presentation on Hedging & Price Risk Management detailing about viz. what is futures contracts and hedging using futures markets, Risks in commodity markets, Mitigation of price risk, How to limit losses by way of hedging, Advantages of hedging, Global Agri Futures perspective, Options etc. This was given by Ms. Bhupalini Kodati;
- Q & A Session was taken up by Mr. Kapil Dev and Mr. Arun Yadav. They Clarified about Price movements and its risks, which are market driven as the market is supreme;
- About Futures & Derivative markets for risk management;
- Advantages of futures market and their regulations.

They also proposed to take more sessions for our CLFMA OF INDIA members, which is under discussion.

On 27th April, 2021, virtual Team's meeting was held to discuss about the Non- Renewal of the CLFMA OF INDIA membership, it was decided that the Proposer and the Secunder of the member companies should be contacted. Further to this, the Proposer and Secunder names have been circulated to all the Managing Committee Members and the Chairman requested all the Managing Committee Members to take it seriously and help us in membership renewal process.

Further to the circulation of the presentation on "Milk and Cattle Feed Quality" by Schreiber Dynamix Dairies Pvt. Ltd. to all CLFMA OF INDIA members on 29th April 2021, CLFMA OF INDIA conducted a virtual meeting along with Schreiber Dynamix Dairies Pvt. Ltd. Mr. Laxman Kolambe Team Advisor, Veterinary Services co-ordinated the meeting. The other speakers from Dynamix Dairies were Mr. Dimitri Humbert, Mr. Neeraj Singhanian, Mr. Partha Tripathy, and Mr. Pravin Awati. Chairman welcomed all the speakers and participants. Around 26 participants attended the meeting. From CLFMA OF INDIA Mr. Neeraj Kumar Srivastava, Chairman, Mr. Divya Kumar Gulati, Dy. Chairman, Mr. Suresh Deora, Hon. Secretary, Mr. S. V. Bhawe, Past Chairman, Dr. Dinesh Bhosale, Past Chairman, Dr. Prashant Shinde, MC Member and Ms. Chandrika Venkatesh, Executive Director attended the meeting.

The objective of the meeting was to discuss about "Milk and

Cattle Feed Quality" and the milk contaminants Viz. Antibiotics, Aflatoxin and Melamine were discussed in detail. The highlights of the meeting were:

- To make this as an eminent platform to discuss all issues related to dairy and cattle feed and have review meetings in an interval of 2 months;
- CLFMA OF INDIA to suggest the dairy plants to be included into this dairy platform.
- CLFMA OF INDIA and Dynamix Dairies to come up with a Cattle Feed Raw material test procedure book so that it can be distributed to all the Cattle Feed Manufacturers.
- To conduct a seminar in June regarding this topic.

The soft copy of the LFT issue of Jan 2021 to March 2021 has been circulated to all members, we apologise for not sending the hard copies due to COVID pandemic with printing restrictions and postal movements.

On CLFMA OF INDIA request, on 3rd May 2021, we got a letter from Dr. O.P. Chaudhary, JS, Ministry of Fisheries, AH&D, Dept. vide which Government allowed Manufacture and Transportation of Animal Feed / Feed Ingredients and Fodder under the essential services, so that Livestock sector may not suffer from feed shortages, which were not included under the list of essential services earlier and severely affected the livestock sector a lot.

On 3rd May 2021 BIS Nomination of CLFMA Representatives as follows:

- In Expert Panels under FAD 5 for reviewing NDDDB test methods, CLFMA nominated Dr. Prashant Shinde, Cargill.
- Expert panel for preparation of P-draft on Block Making Machine CLFMA nominated Mr. Suresh Deora, Hon. Secretary
- Expert panel for preparation of P-draft on Dung Cleaner CLFMA nominated Mr. Suresh Deora, Hon. Secretary, CLFMA
- Expert Panel for review of IS 1374:2007 Poultry Feeds – Specification for examination and recommendations on the matter CLFMA nominated Dr. R. S. Masali- General Manager–Nutrition, Godrej Agrovet Limited

- Expert Panel for reviewing the Indian Standards on feed ingredients CLFMA nominated Mr.Suresh Deora, Hon.Secretary, CLFMA

On May 3, 2021, request for comments on Preliminary Draft of FAD 05 (17292): CODE OF PRACTICE FOR THE REDUCTION OF AFLATOXIN B1 IN RAW MATERIALS AND SUPPLEMENTAL FEEDING STUFFS FOR MILK PRODUCING ANIMALS was sent to CLFMA Dairy Committee.

Further on the same day i.e. on May 3, 2021, request for comments on Wide Circulation of FAD 05 (17280) : ANIMAL FEEDING STUFFS DETERMINATION OF TRYPTOPHAN CONTENT was sent to Dr. R. S. Masali.

On May 4, 2021, request for comments on Wide Circulation of FAD 05 (17282) : ANIMAL FEEDING STUFFS DETERMINATION OF ASH INSOLUBLE IN HYDROCHLORIC ACID, was sent to Dairy Committee.

Further on the same day i.e. on 4th May, 2021, request for comments on Wide Circulation of FAD 05 (17281) : Determination of water-soluble chlorides content Part 1 :Titrimetric method, was sent to Dairy Committee.

We are waiting for the Press release to be released of Dr. Sanjeev Kumar Balyan, Hon'ble Minister of State of Fisheries AH&D. Meeting conducted by CLFMA Member Dr. Sujit Kulkarni in the month of April.

On May 10,2021, CLFMA's request led to opening of Poultry Shops for specified duration per day. Mr. Atul Chaturvedi, Secretary DAHD issued DO in this regard to all Chief Secretaries to all States and Union Territories

On May 11,2021, CLFMA extended huge thanks to Hon'ble Minister Giriraj Singh and Hon'ble Minister Dr.Sanjeev Kumar Balyan for responding very positively to the Representation of All India Breeders' Association (Ref. 2nd April) & CLFMA OF INDIA (Ref. meeting held on 23rd April).

On 11th May 2021, Ministry of Animal Husbandry, Dairying and Fisheries issued Office Memorandum with recommendation to Ministry of Commerce and Industry to allow 1.2 Million MT Soybean Meal duty free import to help Livestock Industry. CLFMA also expect this recommendation will help to control wrong speculation on present and future trading of Soybean seed and Soybean meal."

Facebook and linkedin social media update FOR THE ABOVE:

After Thanks hon'ble @ministers

@GirirajOffice &

@Dr.Sanjeev Balyan

For positive response to AIBA repre. dt April2 & #CLFMA of India meeting dt.April 23,. OnMay 11 Ministry of AHDF issued memorandum recommending to Commerce Ministry to allow duty free import 1.2 million mt soybean Meal. This decision by the #government will be very beneficial to the #livestock #industry. We expect this recommendation will help to control wrong speculation on present and future trading of #soybean seed & #soybean Meal.

Twitter updates

Thanks hon'ble ministers

@GirirajOffice &

@drsanjeevbalyan

for positive response to AIBA repre. dt April 2 & CLFMA meeting dt. April 23,. On May 11 Ministry of AHDF issued memorandum recommending to Commerce Ministry to allow duty free import 1.2 million MT soybean Meal.

We have apportioned a "CLFMA OF INDIA STAFF EMERGENCY RELIEF FUND" for collection of donations to help CLFMA OF INDIA staff during untold situations like COVID, etc.

On 13th May, CLFMA Chairman, Mr. Neeraj Kumar Srivastava gave an interview to the FEEDINFO, Ms. Iffat Fatima. A link of an interview was shared to all Members. He told Feedinfo that "India's animal feed market is expected to grow at a compound annual growth rate of 6.09% over the forecast period to reach a market size of US\$16.653 billion in 2025 from US\$11.677 billion in 2019". We expect to achieve pre-covid feed demand and feed production levels by the end of FY22 only and this is very much dependent upon the recovery of B2B sales in Restaurants, Hotels, QSR Chains and Eateries", Mr. Neeraj Srivastava added. "However, we are yet to achieve the pre-COVID demand levels for Livestock Products and Livestock Feed as B2B demand from restaurants and QSR chains has not recovered and feed raw material prices like Soybean have increased drastically by more than 40%." The CLFMA chairman went on to say that the lockdowns and restrictions in India is witnessing due to the second severe wave of COVID-19 in the country & will "certainly impact the demand of livestock products and feed production adversely." He also added that a lot of efforts were made by the industry,

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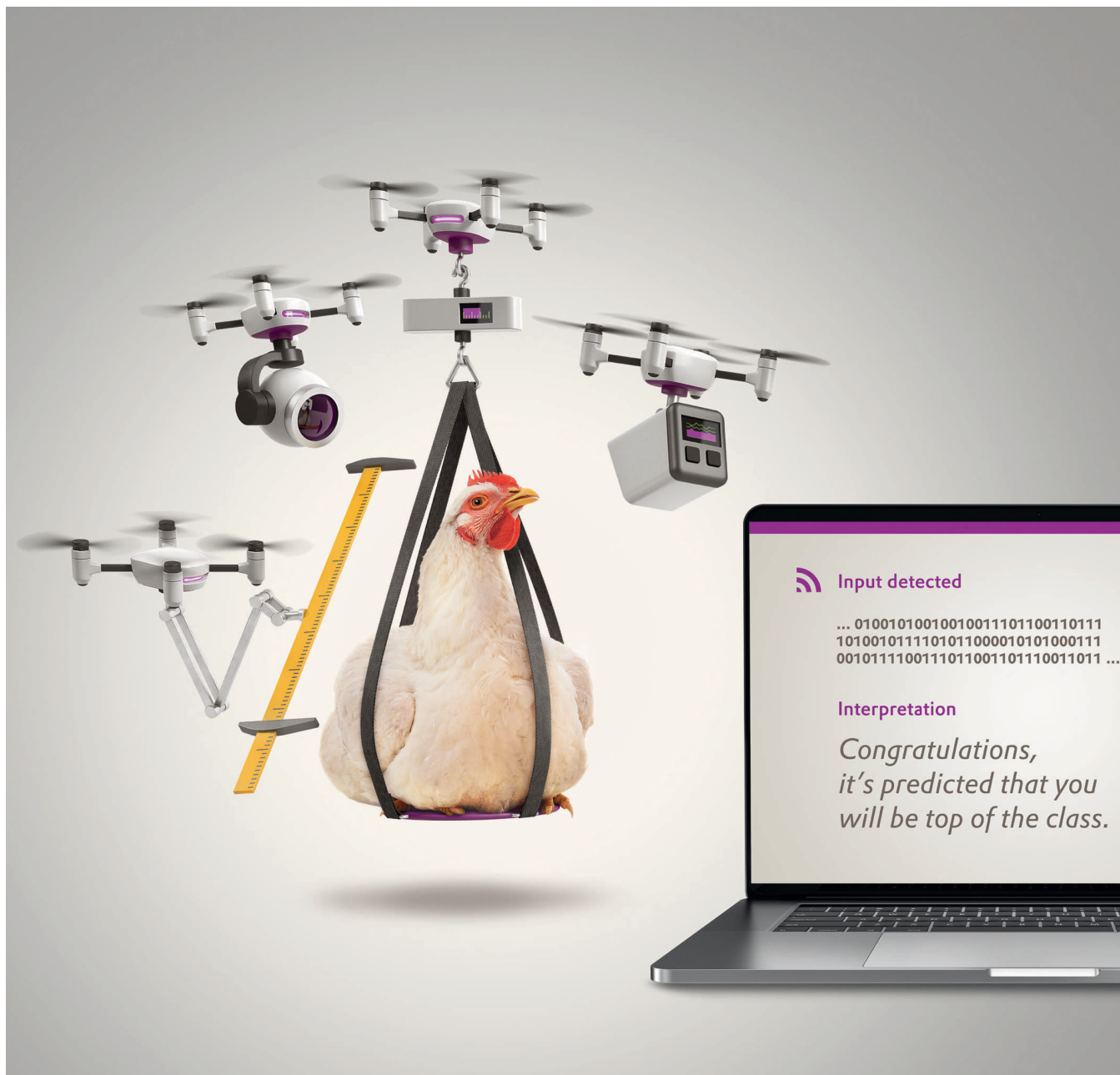
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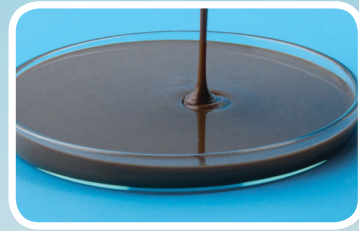
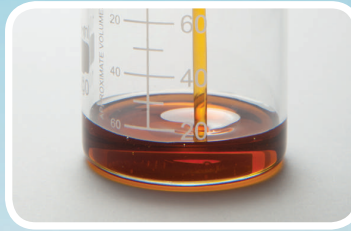
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supported by the Ministry of Agriculture to increase consumer confidence and consumption of poultry and cattle products. By the end of Q2 FY21, the poultry sector bounced back with as much as 70% consumption in comparison to pre-COVID times," he said. "The Cattle Feed Industry also improved due to an increase in global prices of skimmed milk and domestic demand to the tune of 70-80%." However, he added that, the demand for poultry products crashed with the outbreak of bird flu at the beginning of 2021. "The bird flu outbreaks in a few parts of the country caused consumers again to refrain from poultry product consumption, and that led to a crash of the market in January-February 2021", he told Feed info. When asked about the recent surge of new COVID-19 cases in India and the impact on the industry, Mr. Srivastava said that the feed sector will continue monitoring the evolving situation. CLFMA is very much concerned by these developments and is having a close look at the evolving situation. We will continue to work with the Government and various other stakeholders in policy-making to support the animal feed industry during these unprecedented times", he said during the interview.

Export of Oil Meals for the Month of April 2021 received from SEA on 19th May, 2021 circulated to all Managing Committee Members on the same day.

On 21st May, 2021, we got an invitation from Naina Sharma on the PLI Scheme. The Meeting scheduled on the same day at 4:00pm. They have shared the link on discussion with the Secretary DAHD, Mr. Atul Chaturvedi on the PLI Scheme. GOI also invited some Dairy and Poultry Companies for the Meeting. From CLFMA Chairman, Mr. Neeraj Kumar Srivastava attended the Invest India PLI Meeting scheduled on 21st May, 2021, presided by Shri Atul Chaturvedi, Hon'ble Secretary AHD, on receipt of highlights of PLI meeting presentation (Production Link Incentive Scheme) circulated to all CLFMA Members.

CLFMA in association with NCDEX successfully conducted one Webinar on "Hedging Price Volatility of Feed Ingredients using Commodity Derivatives" on Monday June 14, 2021 from 16:00 hrs to 17:30 hrs with 270 participants. Dr. Sujit Kulkarni, MC Member of CLFMA, moderated the sessions. As a CLFMA Chairman I have given Welcome Note. Mr. Kapil Dev, Mr. Sumit Gupta, Mr. Rajib Saha & Ms. Rajni Panicker were the panellist for this Seminar. The Seminar ended with Q&A Session and Hon. Secretary Mr. Suresh Deora concluded the seminar. Press Release has been circulated to all Members.

Representation letter dtd 15th June, 2021 sent to Shri. G. N. Singh, Joint Secretary (Admin/Trade/GC/PC/IC), Room No.248C, Dept. of Animal Husbandry, Dairy & Fisheries, New Delhi - 110 001 on the subject NOC requirement for Import consignments - reg. with a cc copy to Dr. V. Somani, DCGI, New Delhi - 110002, Dr. Dipankar Biswas, (RO) - Southern Region, AQCS, Dept. of AH&D, Chennai - 600100, India & Dr. Gagan Garg, Assistant Commissioner (AH), GOI, Min. of F&AH&D, New Delhi - 110 001 on the request of one of our Members Quadrigen VetHealth Pvt. Ltd., Bangalore.

On 16th June, 2021 letter sent to Shri Arun Singhal, IAS, CEO, FSSAI, New Delhi on the Sub.: Request for extending the Timeline of direction F.NO95 / Std / Misc / SP[L&C/A] / FSSAI2015-Pt-1 dated 27th January, 2020 by 31st of December, 2021 and subsequently similar letter sent on 24th June, 2021 on the same ground to Ms. Varsha Joshi, Joint Secretary (CDD) with a cc to Mr. Rajesh K Gupta, Dy. Commissioner (DD).

On 22nd June, 2021 CLFMA wrote a letter to Smt. Nirmala Sitharaman, Hon'ble Finance Minister, Government of India, Ministry of Finance, New Delhi on the subject Circular regarding use of functionality under Section 206AB and 206CCA of the Income-tax Act, 1961- reg. and requested to the concerned department of Government of India i.e. Ministry of Finance /Department of Revenue to postpone the Circular for a minimum period of three months, so that it can be understood and implemented.

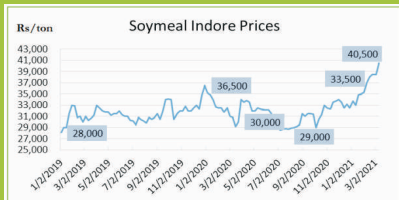
CLFMA of India actively supported to SEA - IOPEPC Webinar in association with SOMA on the Topic - "Wonder Nut - Groundnut" - Prosperity through Productivity on Saturday, June 19th, 2021 from 10:45am to 01:00 pm IST with an active participation of 522 participants.

On 29th June, 2021 CLFMA wrote a letter to Ms. Nitasha Doger, Scientist D & Member Secretary of BIS with a cc copy to Shri. Atul Chaturvedi, Secretary AHD, Mr. Pramod Kumar Tiwari, Director General BIS, and Shri. Arun Singhal, CEO, FSSAI requesting for involving few ingredients processing / manufacturing associations also for reviewing IS standards for different ingredients used in compound cattle feed.

CLFMA is planning for some more webinars in the coming months, out of that CLFMA has Scheduled a webinar in association with NCML(AGCON) on the Topic - "Maize & Soybean : Market Driving Factors & Price Outlook' 2021 on Friday, July 09, 2021 from 16:00pm to 17:45 pm IST.



CLFMA OF INDIA
ASSOCIATION OF LIVESTOCK INDUSTRY



Online Registration Link :

<https://forms.gle/Q5CZaXzcVSHHJv7o6>

April 12, 2021 - Time : 5 pm to 6.30 pm

**Online Panel Discussion
on
“Soybean and other Oilmeals
Demand and Supply Outlook -
Present & Future”**



Industry Expert

Dr. Davish Jain
Chairman, SOPA



Industry Expert

Dr. B. V. Mehta
ED, SEA



Industry Expert

Mr. Bahadur Ali
Chairman, AIPBA



Industry Expert

Mr. B. Soundarajan
MD, Suguna Holdings



Industry Expert

Dr. B.M. Masthan Rao
Chairman, BMR Group



Industry Expert

Dr. P. Krishnaiah
IAS retd., advisor, Shrimp
Feed Manufacturers Association



Moderator

Mr. Neeraj Kumar Srivastava
Chairman, CLFMA OF INDIA



Industry Expert

Dr. Dinesh Bhosale
RSD, AB Vista, SA



Vote of Thanks

Mr. Suresh Deora
Hon. Secretary, CLFMA OF INDIA

Host :
Ms. Chandrika Venkatesh,
ED, CLFMA OF INDIA

Press Release Report

CLFMA OF INDIA, the apex organization and the voice of the country's dynamic livestock sector conducted an "Online Panel Discussion with the objective to discuss the Present Raw Material Situation (Demand & Supply) of Soybean and other Oil meals in India and to enable all industry players to come together and show solidarity for representing the government in all matters. An expert opinion about this burning topic was the need of the hour.

The online panel discussion started with a welcome address by Mr. Neeraj Kumar Srivastava, Chairman, CLFMA OF INDIA. He also moderated the session and started by introducing CLFMA OF INDIA to the panellists and participants and the pivotal role played by CLFMA for the upliftment and sustainability of compound feed industry and animal farmers.

The panellists were:

- Dr Davish Jain, Chairman, Soybean Processors' Association of India (SOPA)
- Dr.B.V.Mehta, Executive Director, Solvent Extractors' Association of India
- Mr. Bahadur Ali – IB Group and President of All India Poultry Breeders Association (AIPBA)
- Mr. B. Soundararajan - MD, Suguna Holdings and Former Chairman of CLFMA OF INDIA
- Dr.B.M.Masthan Rao, Chairman, BMR Group
- Dr.P.Krishnaiah, IAS (Retd.), Advisor, Shrimp Feed Manufacturers Association and
- Dr. Dinesh Bhosale – Sales Director, AB Vista South Asia and Former Chairman of CLFMA OF INDIA

After introduction of panellists, Mr Neeraj in his opening address expressed the difficulties faced by the animal agriculture industry due to abrupt increase in soybean prices. He emphasised that feed cost is more than 70% of the total cost of animal production and increase in feeding costs

makes the farming unprofitable, discourages farmers to reduce production and in turn leads to shortage of protein to the Indian population that is already protein deficient. Livestock in India currently supply around 47% of the protein requirement milk, egg, meat, and fish.

Dr Davish Jain, Chairman, Soybean Processors' Association of India (SOPA), thanked CLFMA OF INDIA for inviting him as the panellist and appreciated CLFMA OF INDIA to organize the panel discussion at the relevant time and gave an update of the demand and supply outlook of Soybean and meal keeping in mind the backdrop of covid crisis. He said, the poultry and aquaculture industry put together require 5 million tons of soya meal annually and to produce this a processor requires 6.5 mt/65 lakh tonnes of soya seeds. He added that despite good harvest, the price of the meal has gone up by 50% from Rs 35/- to Rs 58/- per kg. Due to price increase the soymeal consumption for feed industry has declined to 27 lakh tonnes as against 29 lakh tons during the same period last year in the period Oct 2020 to March 2021.

He said that during the Covid crisis last year, most of the people invested in the commodity markets and real estates. With the huge stimulus packages introduced by all the countries all over the world lot of funds were seen pouring around in the commodity, physical, stock and real estate markets. There was a loss of production in the soyabean market of Argentina also, which is the largest exporters of soyabean oil in the world.

This year 104 MMT of soyabean has been produced as per the estimates of SOPA. There will be 93.5 lakh tons available for crushing and sowing needs and other direct consumption hence the residual meal after taking care of 18 lakh ton of exports should be sufficient for industry needs. Out of this 16 lakh tons has already been exported in first six months and for the remaining period exports should not be more than 2-3 lakh tons. The Indian exports contract has already been

INDIA SOYBEAN: SUPPLY/USAGE/STOCK									
MTH	PRON 2020-21 : 104.55 LT OPENING STOCK: 5.16 LT MP 41.72/MAH 45, 44/RAJ 8.58/TELANGN 1.64/KTK 3.72/IMPORT 3.00 LT TOTAL SUPPLY 100.71 LT			PRON 2019-20 : 93.06 LT OPENING STOCK: 1.70 LT MP 40.10/MAH 36.29/RAJ 6.56/AP 1.50/ CG 0.53/GUJ 0.86 LT/IMPORT 3.00 LT TOTAL SUPPLY 97.76 LT			PRON 2018-19 : 109.33 LT OPENING STOCK: 1.50 LT MP 59/MAH 38/RAJ 9.45/AP 1.57/ CG 1.10/GUJ 1.2 LT/IMPORT LIKELY 1.80 LT/TOTAL SUPPLY 112.63 LT		
	ARRIVAL	CRUSH	STOCK FARMER + MILL	ARRIVAL	CRUSH	STOCK FARMER + MILL	ARRIVAL	CRUSH	STOCK FARMER + MILL
OCT	18.00	9.00	87.48	12.00	7.20	82.32	21.00	9.50	88.74
NOV	19.00	11.00	76.22	18.50	9.00	73.01	20.00	10.50	77.86
DEC	15.00	12.00	63.75	15.00	9.80	62.96	15.00	11.50	65.82
JAN	12.00	12.50	51.19	9.00	8.40	54.36	11.50	10.00	55.45
FEB	6.00	7.50	43.44	4.50	6.50	47.61	5.50	7.50	47.69
MAR	4.75	6.50	36.64	1.25	4.00	43.35	4.00	9.00	38.42
APR				0.20	3.70	39.41	4.00	6.00	32.18
MAY				2.00	6.50	32.65	3.75	5.50	26.46
JUNE				5.00	7.20	25.16	4.50	5.50	20.74
JULY				5.00	7.20	17.74	5.00	6.50	14.04
AUG				3.00	6.00	11.65	3.00	5.00	7.85
SEP				4.00	5.50	5.36	3.00	5.50	2.20
TOTAL	74.75	58.50	36.64	79.45	87.50	11.70	100.25	93.50	2.20
LAST YEAR	60.25	44.90	43.65	100.25	93.50	2.20	STOCK EXCLUDE FOR SOWING 12.00 LT NEW CROP ARRIVED IN SEP 2 LT, EXPORT 1.60 LT		
SOURCE : SOYBEAN PROCESSORS ASSN. OF INDIA, INDORE									

completed; the consumption of 27 lakh tons was estimated for the first 6 months and next 6 months the estimates of the consumption from feed industry is 23 lakh tons and the residual soya bean crop as per the SOPA's estimates at the end of March 2021 is 36.64 lakh tons of soya, which accounts roughly about 3 MT of soymeal or 30 lakh tons of soymeal for exports.

Mr. B. Soundararajan gave the consumer perspective on spurt of prices of soymeal even despite the availability. As per his overall estimation in India the broiler feed production is 14.5 MT, Breeder Feed accounts for about 3.3 MT and Layer Feed is 10.22 MT. Poultry alone will require the total consumption of estimated soymeal of 56 lakh tones excluding aqua and dairy feed and is estimated based on the prices which may go up or down by another 10%. If prices are lower than the consumption will be 60 lakh tons and if high it will be around 50 lakh tons. Currently 4.5 MT of meal is required in the country and overall, we are paying around Rs 20,000 to Rs 25,000/- more than the normal market prices. This is the excess price premium presently paid by the poultry industry.

Mr. Bahadur Ali said, the poultry industry has reacted late and asked for import of 12 mt, at this juncture whether the govt will consider proposal, is questionable. He added that the price hike is due to the NCDEX commodity trading and the govt. should control this forward trading and we must approach the govt. and ask them to support the soyabean farmers and the poultry industry.

He also added that the poultry industry has started utilizing other alternate feed like DDGS, sunflower, maize protein and are not dependent on soya meal alone. The current price hike is artificially created on the social media. He also said that the Feed Consumption in the poultry has reduced by 20% to 25% due to summer (April, May, June) and due to corona, the poultry production is reduced by 20%.

Dr. P. Krishnaiah, said that, the Shrimp Feed Manufacturers Association has estimated the requirement of soymeal including aquaculture to be 9 lakh tons. Sudden surge of prices of soya meal directly impacts the cost of aqua feed and the major reason is soymeal that constitutes 60% of the feed volume of aqua feed and in shrimp culture. The feed cost is 60-75% of the total cost and in this 60% is by way of soymeal hence, there is a direct impact on the aqua culture industry. He cited the main reason for price hike is hoarding by certain states. He suggested to request import of soymeal up to 9 lakh tons. Fish and shrimp has provided an employment opportunity for about 20 lakh employment in the rural areas that will be adversely impacted otherwise.

Dr. B.V.Mehta appraised that there is a surplus availability of other oil meals in the country. This year, we had a bumper soyabean, ground nut and cotton crop. Rice bran production is 8.5 to 9 MT out of this 5.5 MT is processed for rice bran oil, 3 MT of rice bran is used by cattle and poultry feed. Out of 5.5 MT, we produce about 1 MT of the rice bran oil and 4.5 MT of rice bran extraction. Out of this 4.5 MT, we export about 2-3

MT mainly to Vietnam. This year there is a failure of crop in Bangladesh leading to increase in demand from there that was fulfilled by Indian export. Now Bangladesh will be harvesting a new crop and hence the demand will slowly reduce from Bangladesh. Overall Rice bran is at comfortable level. Out of 8.5 MT of rice bran, if we take out 1 mt of rice bran oil, the availability will be 7 MT of rice bran extract and is consumed by cattle feed industry.

Due to soyabean price increase the mustard oil has become cheaper than the soya bean oil. In the next 4-6 month there will be lot of availability of rape and mustard oil. Dr Mehta suggested that to curb the false price rise NCDEX trading should be regulated. Also, to address the sentiments of the poultry industry govt. should allow import of at least 0.5 MT of soymeal and this will caution the hoarders.

The govt number of availabilities of soymeal is 13.5 mt as against 9 mmt estimated by the industry association and it is really a challenging situation to establish imports because of this gap.

Also, world production is not less. Dr Mehta added that this shortage is temporary and advised industry to slow down distress buying and try to use alternated meals which ever is available in the lean period (March to Aug).

Dr.B.M.Masthan Rao, commented that, the Aqua culture particularly shrimp economy is very sensitive to price variation, since 70 -75% of the cost of cultivation of shrimps is feed and any price fluctuation in the feed cost make the cultivation unviable. The BMR group being an organized sector survived with bare minimum margins. Also, Aqua culture employs about 20 lakh farmers and farm workers and another 25 lakhs from non-farm sector are also supported by the aquaculture industry. Most of the shrimp and fish farmers are dependent on the aquaculture.

Shrimp sowing of seeds in the pond has started from the month of Feb. This year the price of feed has gone up and hence shrimp industry is affected. He gave the suggestion to import certain quantity of DOC as it is the main ingredient i.e., 50% for shrimp and 20% of fish feed production. Shrimp & Aqua feed industry requirement is around 0.9 mt out of this 46% is soya meal, so far the consumption of soya meal in Feb and March by aqua industry has been hardly 1 lakh MT and another 8 lakh MT shall be needed before Sep. Last year during the same time the prices of soya meal was 37,000/- per Mt ex-factory and now the price is 69,000/- per Mt soymeal. Since in the inclusion of preparation of compound feed 50% is protein, this price is not viable. In addition, the ocean freight charges, and transportation charges has also gone up. He suggested to present the case to the PMO. He said that the, hoarding must be prevented first in the states of Maharashtra and MP.

Dr. Dinesh Bhosale gave the insights about of impact of soymeal being used as animal feed and compared the use of other meals with soymeal as alternatives and their limitations. He thanked CLFMA OF INDIA for organizing this

online discussion. He said that, if farmers are protected then only our poultry industry can also be protected.

He added that feed cost is 70% of the total cost of cattle, fish, shrimp and poultry production. If we consider broiler then, we have 35% inclusion of soymeal in starter feed and 30% in finisher feed. One broiler gets ready after eating 3500 gms feed and out of this 1 kg is soymeal. Apart from soymeal various other raw materials like meat & bone meal, synthetic amino acids like lysine, methionine and tryptophan are added while preparing compound feed. Soymeal digestibility is very good with considerable quantity of lysine but limited by methionine and cysteine content.

He said, although all the panellists are of the opinion that, we must manage the industry with other alternative feeds but govt should allow import especially in south India as it makes the cost cheaper compared to other areas. Hence in south India govt. should allow at least 1mmt of soymeal imports, we can discourage GM seeds. but GM soybean DOC can be imported.

Layer feed has complicated ingredients and in this the soymeal inclusion is 5-10% and in the complete life cycle layer bird consumes 48 kg feed and out of this 5 kg is soybean DOC. Since the prices of soya has increased and there is a shortage in availability, it is only used currently in chick and grower mash. From layer mash the soybean doc has been completely removed to curtail increased feeding cost.

If we talk about cattle feed soybean DOC, 100 MMT is required and 12 MMT of cattle feed is manufactured by our industry and remaining 88 MMT raw material is fed to animal

directly. The 12 MMT of soybean doc for cattle feed is very less, as calf starter, milk replacer, transition feed, all these high-cost feed uses soymeal DOC. In shrimp and fish feed dehulled soybean is required. He advised all SOPA members to manufacture de-hulled soybean meal and sell it to poultry and shrimp feed industry. He also said that NCDEX should encourage only actual buyers and speculators have no role to play.

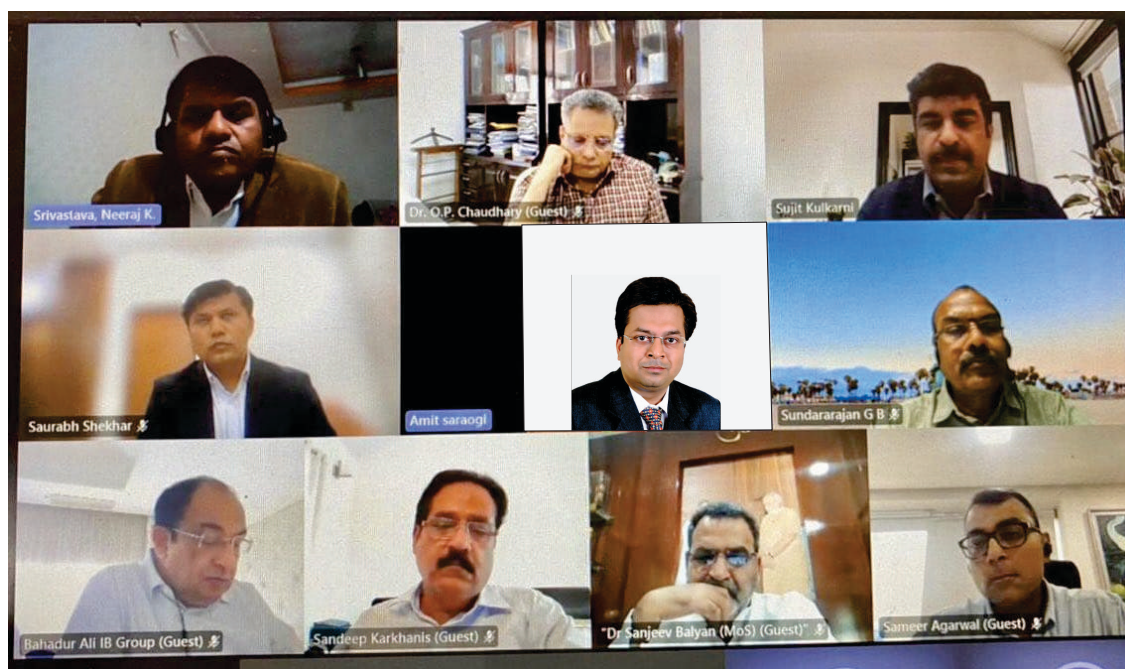
Vote of thanks was proposed by Mr. Suresh Deora, Hon. Secretary, CLFMA OF INDIA

The main points summarized by him are as follows

- Govt statistics shows that there is 30 lakh ton of soya availability for the feed industry and the largest consumer is poultry and aqua industries.
- The prices of soya have gone up by 50% and the biggest culprit for this price increase is speculation by the NCDEX and is fuelled by social media, to ease this we should ask the govt. to allow a lesser quantity of import of soymeal to bring the sentiment down and cool the market
- The panic buying should be discouraged
- We have to approach the govt collectively on all these issues
- We have to approach jointly to SEBI for the purpose of regulating the NCDEX from doing speculations, moving to real market and examining the controls we have to bring in



Online Interactive Meeting of Indian Livestock Key Stake Holders with Hon'ble Minister Dr. Sanjeev Balyan, MOS AHD & F, GOI and Dr. O.P. Chaudhary, JS, (NLM/PC), AHD, GOI held on 23rd April 2021



CLFMA OF INDIA, the apex organization and the voice of the country's dynamic livestock industry conducted an online Interactive meeting of Indian Livestock Key Stake Holders with Honorable Minister Dr. Sanjeev Balyan, Minister of State Animal Husbandry, Dairying, Fisheries Govt. of India and Dr. O. P. Chaudhary, Joint Secretary, Animal Husbandry, Dairying, Govt. of India held on 23rd April 2021. Key objective was to discuss on anomalous rise in prices of Soybean seed and Soybean DOC which results in enormous production cost leads to challenging circumstances for livelihood of livestock farmers of India.

Other key stake holders who participated in meeting were Mr. Bahadur Ali, Chairman of IB group and President of All India Poultry Breeders Association (AIPBA), Mr. G. B. Sundararajan, MD, Suguna Group, Mr. Gopal Reddy, Director, Sneha Group, Dr. Sandeep Karkhanis, MD of Noveltech Group,

Mr. Sameer Agarwal, MD, Shalimar Group, Mr. Amit Saraogi, MD of Anmol Feeds, Mr. Gulrez Alam, Director, IB Group, Dr. Saurabh Shekhar, MD of Nutreco India, Mr. Neeraj Srivastava, Chairman of CLFMA and MD of Novus India, Dr. Sujit Kulkarni, Managing Committee Member CLFMA and Director- Feed Additives, Nutreco India.

Online interaction started by Dr. Sujit Kulkarni who moderated the session. After warm welcome of Honorable Minister Dr. Sanjeev Balyan and Joint Secretary, (NLM/PC), AHD, Dr. O. P. Chaudhary, Dr. Sujit Kulkarni introduced all key stakeholders of Indian Livestock Industry who were present in this session to the honorable minister and joint secretary.

Dr. Saurabh Shekhar briefly introduced Honorable Minister Dr. Sanjeev Balyan and Dr. O. P. Chaudhary, Joint Secretary, (NLM/PC), AHD.

After welcome and introduction session, Mr. Neeraj Srivastava, Chairman of CLFMA elucidated the key objectives of this session. Mr. Neeraj Srivastava emphasized present sky high prices of Soybean seed and Soybean DOC which results in huge economic loss of Indian Livestock Industry along with impact of pandemic Covid situation.

Mr. Bahadur Ali thanked for continuous support to Livestock industry from Honorable Minister Dr. Sanjeev Balyan. He further highlighted about impact of extreme high price of Soy and other raw materials, which can lead to close the livelihood of 25% Indian Livestock farmers. Unemployment will be very big issue if present Soybean prices not under control soon. If Poultry production lower down significantly, then it will also damage agricultural farmers, who largely produce other raw materials and supply to Livestock Industry.

Mr. G.B. Sundararajan said estimated production of Soy seed 9.2-9.5 MMT, around 1.2 MMT goes to re-sowing. Out of 8 MMT Soy DOC 6 MMT is required for Animal feed, 0.4 MMT is for human consumption, around 1.8 MMT is export. Still, we have scarcity of around 1.2 MMT Soy DOC even though placement is low due to Covid scenario. Government should allow to import Soy seed and Soy DOC with zero % duty and support livestock farmer's livelihood.

Dr. Sandeep Karkhanis said as per the Govt. data production of Soy seed is normal @ 13.7 MMT. As per SOPA, the Soy DOC is around 10.7 MMT and the requirement of Animal feed mainly for Poultry and Aqua requirement is 5.6 MMT. Looking at numbers we feel that there is ample availability of Soy DOC. Despite of enough availability, there is a volatility in market and continuous upward trend of Soy DOC and Soy seed prices, reasons could be Soy traded on NCDEX where Govt. can enforce compulsion of 10% taking delivery option on NCDEX.

Government should restrict foreign financial investment in NCDEX, which leading to inflationary trend of Soy prices.

Mr. Sameer Agarwal said Government should allow import of Soy seed and Soy DOC with zero % of duty. Government should release the press note regarding action line for such a sky high prices so reverse sentiments may results in low price offers by Soy traders.

Mr. Amit Saraogi said neighboring countries cost of Soy DOC is around INR 50, where as in India, the cost is INR 75/kg. As per data, there is no shortage of Soybean still we are struggling to maintain demand and supply chain. Due to livestock and mainly poultry farming lot of reverse migration happened in Bihar and UP from various states of India. If Soy prices not reduce soon then livelihood of these farmers will be a question mark.

Mr. Gopal Reddy said Livestock industry have to manage existing stock of Soy in country as new crop will arrive after 6 months. Government should look into this on priority and also initiate for demand and supply. Also insist on import of Soy with zero % duty.

Mr. Gulrez Alam said last year before Covid, all rumours about consumption of chicken damaged in a huge way and caused lot of unemployment, Govt. should consider all financial impact on Industry and should take firm steps and support the Industry.

After listening and understanding current challenges of livestock industry Honorable Minister Dr. Sanjeev Balyan assure for quick action from Ministry of Animal Husbandry, Dairying and Fisheries to overcome present issue of such a sky high prices of Soybean seed, Soybean DOC and related raw materials.

Vote of thanks proposed by Dr. Sujit Kulkarni.



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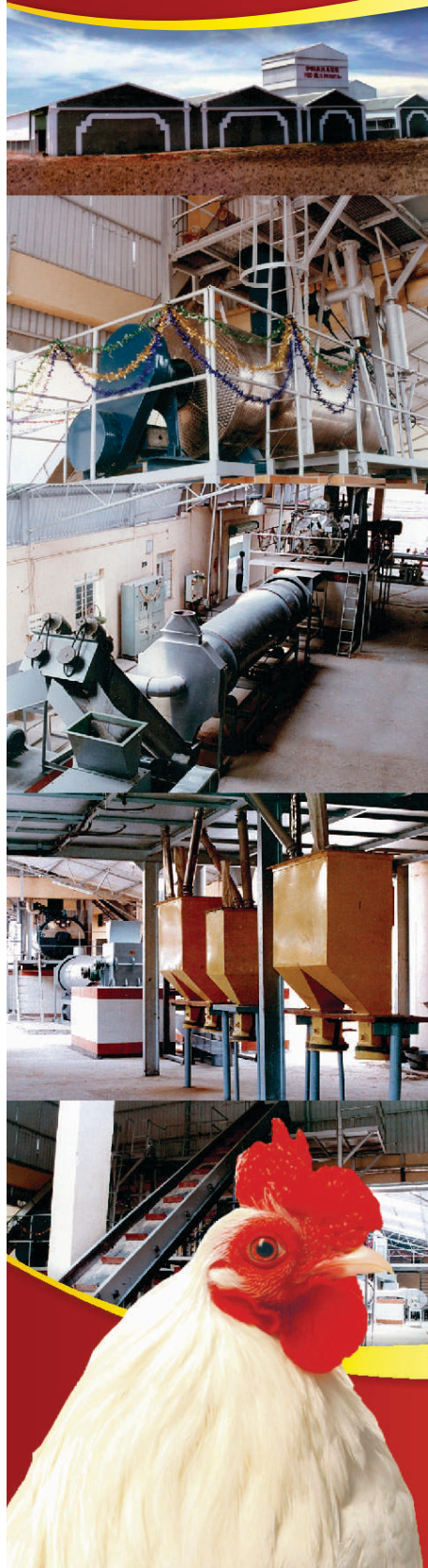
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India's Feed Sector to Grow 6% by 2025; Industry Monitoring Evolving COVID-19 Situation

13 May 2021 - The Compound Livestock Feed Manufacturers Association of India (CLFMA) predicts 6.09% growth for the domestic feed sector between 2019 and 2025, regardless of the second wave of COVID-19 and the soaring prices of raw materials.

"India's animal feed market is expected to grow at a compound annual growth rate of 6.09% over the forecast period to reach a market size of US\$16.653 billion in 2025 from US\$11.677 billion in 2019", Mr. Neeraj Kumar Srivastava, chairman at CLFMA, told Feedinfo.

"We expect to achieve pre-covid feed demand and feed production levels by the end of FY22 only and this is very much dependent upon the recovery of B2B sales in restaurants, hotels, QSR chains and eateries", Mr. Srivastava added. "However, we are yet to achieve the pre-COVID demand levels for livestock products and livestock feed as B2B demand from restaurants and QSR chains has not recovered and feed raw material prices like soybean have increased drastically by more than 40%."

CLFMA chairman went on to say that the lockdowns and restrictions in India is witnessing due to the second severe wave of COVID-19 in the country will "certainly impact the demand of livestock products and feed production adversely."

Mr. Srivastava added that a lot of efforts were made by the industry, supported by the Ministry of Agriculture to increase

consumer confidence and consumption of poultry and cattle products.

"By the end of Q2 FY21, the poultry sector bounced back with as much as 70% consumption in comparison to pre-COVID times," he said. "The cattle feed industry also improved due to an increase in global prices of skimmed milk and domestic demand to the tune of 70-80%."

However, he added that the demand for poultry products crashed with the outbreak of bird flu at the beginning of 2021.

"The bird flu outbreaks in a few parts of the country caused consumers again to refrain from poultry product consumption, and that led to a crash of the market in January-February 2021", he told Feedinfo.

When asked about the recent surge of new COVID-19 cases in India and the impact on the industry, Mr. Srivastava said that the feed sector will continue monitoring the evolving situation.

"CLFMA is very much concerned by these developments and having a close look at the evolving situation. We will continue to work with the government and various other stakeholders in policy-making to support the animal feed industry during these unprecedented times", he said.

Source : Lady IFFAT-Fatima for feedinfo India, Animal Feed



NCDEX
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in association with



Webinar on Hedging price volatility of feed ingredients using commodity derivatives

WEBINAR HIGHLIGHTS

- ❖ Hedging practices in global & domestic markets
- ❖ Price risk management using commodity derivative tools
- ❖ Hedging mechanism - A case study

Date -

14th June 2021

Timings -

4:00 to 5:30 pm

SPEAKERS



Mr. Sumit Gupta
Business Head, South Asia &
SE Asia, Mcdonal Pelz



Mr. Rajib Saha
Manager Derivatives Trading,
ITC ABD Ltd.



Mr. Kapil Dev
Chief Business Officer,
NCDEX



Ms. Rajini Panicker
VP, Commodity Head-
Phillip Capital India



Mr. Neeraj Srivastava
Chairman, CLFMA



Dr. Suresh Deora
Hon Secretary, CLFMA



Dr. Sujit Kulkarni
Moderator -
MC Member, CLFMA

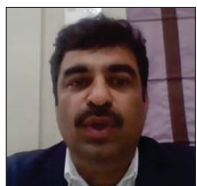
In case of any queries, feel free to Call us on **toll-free 1800 -266-2339**
or leave a message at webinar@ncdex.com

"Webinar on Hedging Price Volatility of Feed Ingredients using Commodity Derivatives" on June 14, 2021 from 16:00 hrs to 17:30 hrs.

CLFMA OF INDIA, the apex organization and the voice of the Country's dynamic livestock industry in association with National Commodity and Derivatives Exchange (NCDEX) organized Webinar on hedging price volatility in feed ingredients using commodity derivatives. In the recent past, commodity prices have seen high volatility which has impacted the normal operations of business. It was thus imperative to understand how to manage this risk using the derivatives platform. The webinar was chaired by the Chairman of CLFMA OF INDIA Mr. Neeraj Srivastava. It included eminent panelists from the industry, Mr. Kapil Dev, CBO NCDEX, Mr Sumit Gupta, Business head, South Asia and South EA, McDonald Pelz, Mr Rajjib Saha, Agri derivatives Manager, ITC ABD Ltd, and Ms. Rajini Panicker from Phillip Capital. All the panelists have an average experience of more than 15 years in the industry. The event was moderated by Dr. Sujit Kulkarni, Managing Committee Member of CLFMA OF INDIA and finally the vote of Thanks was given by Mr. Suresh Deora, Hon Secretary of CLFMA OF INDIA.

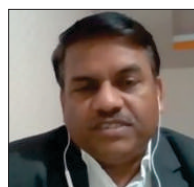
Key objective of the Webinar was to discuss on anomalous rise in prices of Soybean seed and Soybean DOC and Corn which in turn enormous production cost leads to challenging circumstances for livelihood of livestock farmers of India. Webinar highlighted on the following topics:

- Hedging Practices in Global & Domestic Markets
- Price risk management using commodity derivative tools
- Hedging mechanism – A Case Study

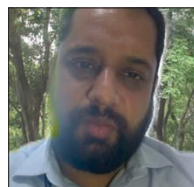


The Webinar started with a welcome address by **Dr. Sujit Kulkarni**, who also moderated the sessions. Dr. Sujit Kulkarni said that since last almost 3 to 4 months our industries have seen the volatility and the unusual spike particularly in Soyabean which led to increase in the feed cost.

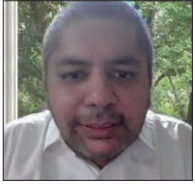
Almost 80% price rise in Soyabean meal price was observed and there was a huge spike in soyabean seed also. So, CLFMA thought it prudent to support the Industry in this crucial time and hence arranged the webinar with NCDEX and invited the commodity market experts to deliberate the issue.



CLFMA OF INDIA Chairman **Mr. Neeraj Kumar Srivastava** thanked Dr. Sujit Kulkarni for giving a very nice brief of the Webinar. He, on behalf of CLFMA and its MC Members, welcomed all. Mr Neeraj Srivastava, in his Welcome Note stated the objectives for the webinar, wherein he highlighted the importance of commodity price risk being a financial risk driven by commodity supply and demand fundamentals. The global commodity markets are facing high volatility due to the supply and demand gaps. It is important to manage this volatility using risk management tools like Futures and Options. The webinar is organized to understand the importance of these tools for effective price risk management and protecting the bottom lines of the business.

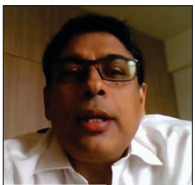


Mr Kapil Dev was the first panelist to speak on the subject. He highlighted the fact that risk is something that is unknown and uncertain. There is health risk, life risk and wealth risk. While we insure ourselves against the life and health, wealth is something that is not insured. Volatility and uncertainty is always there in business largely driven by unknown and uncertain factors. He cited some of the recent examples, droughts, Geopolitical events, biofuel push or logistical bumps like container shortages, Suez Canal blockage for recent volatility in the commodity prices. He explained that these can be effectively managed using the concept of Hedging.



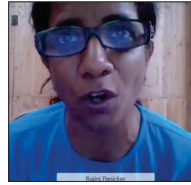
Mr Sumit Gupta was the next panelist to talk on the subject. He further elaborated what Mr.Kapil Dev had explained in his presentation. He explained the weather patterns in terms of El Nino and La Nina periods and how these largely impact

production of Agriculture commodities globally. He mainly focused on Corn and Soybean as these are largely used raw materials as feed ingredients. World corn production should increase to meet the rising demand. Corn prices almost doubled over last year for US farmer while the Indian Corn markets didn't see this kind of rally, this price gap has made Indian corn attractive for exports. He also highlighted the domestic scenario where demand is driven by poultry and starch industry. There has been sharp increase in production and consumption domestically. For Soybean, he stressed on the fact that while the demand was increasing the yield was constant. The demand for Soybean will continue to increase due to increasing awareness on food preferences and income growth. He mentioned that proper research and analysis of the commodity will help in taking informed price decisions.



Mr. Rajib Saha continued where Mr. Sumit Gupta left his presentation and stressed more upon from a business perspective how these price volatilities impact the revenues of business. Corporates must have risk management policy to ensure

that planned targets of annual sales, purchases and profitability numbers are attained to satisfy management and shareholders. It is all the more important for corporates who are into commodities as they have a number of risks including risk of change in government policies on tariffs, overseas trade, weather, currency or even hedge funds' strategies. Procurement via futures gives two-way protections, one is fixing the price and another is immunity from counterparty default. Futures also give price signals as they are reflective of what is going on in the markets both globally and domestically. He urged the participants to at least keep following the prices of futures market to get an understanding of the market fundamentals.



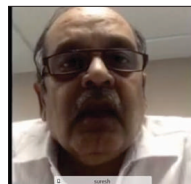
Finally, **Ms. Rajini Panicker** explained the role of a member in the ecosystem of Futures market. She highlighted how they work with various value chain participants to device customized strategies for them based on their raw

material requirement. She also explained in detail the opportunity loss in Soybean if the market participants had hedged Soybean this year. This year being highly volatile, she explained the same for the last year as well, where if hedged the corporate would have saved about 4-6% in their overall procurement costs. She summarized her presentation by saying Securing raw material purchases through far-month commodity futures contracts not only gives the protection from potential rise in prices at a later date but also raises the efficiency of capital through leveraged transactions.



Webinar participants actively participated in Question and Answer session and Panelists

answered their Questions satisfactorily.



Mr. Suresh Deora, Hon. Secretary of CLFMA OF INDIA concluded the webinar by thanking the panelists for their valuable inputs and the audience for participating and making the event a success. CLFMA OF INDIA will associate

for more such programs for the benefit of the feed industry at large.

The event was attended by 270 participants and total registrations received were 317.

"Webinar on Wonder Nut - Groundnut" on June 19, 2021 from 10:45 hrs.




SEA - IOPEPC WEBINAR

IN ASSOCIATION WITH



CLFMA of India & SOMA

ON

Wonder Nut - Groundnut

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FOCUSING ON Cultivation, Production Technology, Marketing, Export and Value Addition

Saturday, 19th June, 2021 | 10.45 am to 1.00 pm IST

To Register for Webinar, **CLICK HERE**; or visit <https://tinyurl.com/groundnut2021>

ESTEEMED SPEAKERS AND PANELISTS

 <p>Shri Sudhanshu Pandey Secretary (Food & Public Distribution) Min. of Consumer Affairs, Food and Public Distribution, Government of India</p>		 <p>Smt. Shubha Thakur Joint Secretary, Ministry of Agriculture, Cooperation & Farmers Welfare, Government of India</p>	
 <p>Shri Kishore Tanna Chairman, SEA Groundnut Promotion Council & Convener, Groundnut Panel, IOPEPC</p>	 <p>Shri Atul Chaturvedi President, SEA</p>	 <p>Shri Khushwant Jain Chairman, IOPEPC</p>	
 <p>Shri Govindbhai Patel Managing Partner, GGN Research</p>	 <p>Shri Angshu Mallick MD & CEO, Adani Wilmar Ltd.</p>	 <p>Shri Tushar Thumar Director, Shreeya Peanuts Pvt. Ltd.</p>	 <p>Dr. Pradeep P. Mahajan Consulting Animal Nutritionist & Member Dairy Technical Committee, CLFMA</p>
 <p>Smt. Manisha Gupta Editor – Commodity & Currency CNBC TV18 & CNBC Awaz</p>	 <p>Shri Priyam Patel Vice President, N.K. Proteins Pvt. Ltd.</p>	 <p>Shri Nagraj Meda Managing Director, TransGraph Consulting Pvt. Ltd.</p>	 <p>Shri Mayur Mehta Editor, Commodity World</p>
 <p>Shri Mukesh Nathwani Chairman, Gulab Oils & Foods Pvt. Ltd.</p>	 <p>Shri Vivek Pathak Director, Athena Tradewinds Pvt. Ltd.</p>	 <p>Dr. B. V. Mehta Executive Director, SEA</p>	

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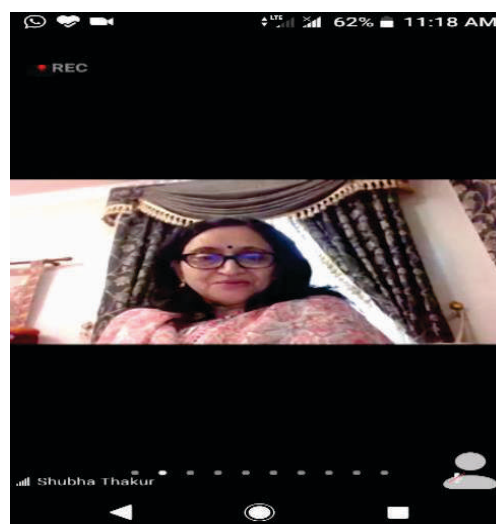
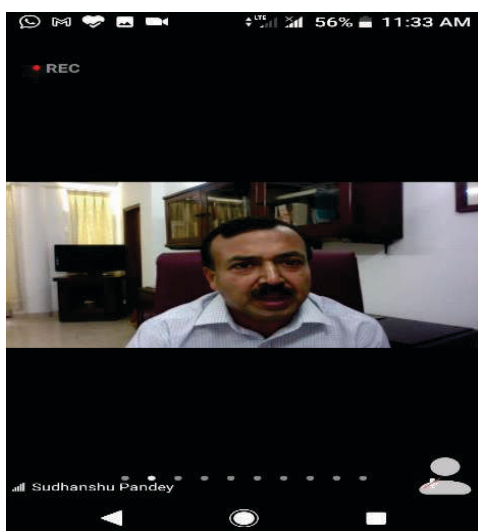
GULAB
OILS

CONFERENCE PROGRAMME ON NEXT PAGE

CLFMA OF INDIA, the apex organization and the voice of the Country's dynamic livestock industry supported the webinar on "Wonder Nut – Groundnut" Prosperity Through Productivity: Focusing on Cultivation, Production Technology, Marketing, Exports and Value Addition in Groundnut, conducted by The Solvent Extractors' Association of India (SEA) and Produce Export Promotion Council (IOPEPC). The webinar was also supported by Saurashtra Oil Mills Association (SOMA).

Welcome address was delivered by **Shri. Atul Chaturvedi, President, SEA** and **Shri. Khushwant Jain, Chairman, IOPEPC.**

Shri. Atul Chaturvedi, President, SEA welcomed all the participants to the first webinar being organized on Groundnut by SEA in association with IOPEPC and **supported by CLFMA** of India and SOMA. He stated in his welcome address that they were honored at the presence of **Food Secretary, Shri Sudhanshu Pandey & Ms. Shubha Thakur, Secretary in Agriculture Ministry.**



Their presence reflected the importance, which policy makers in the Government are giving to Groundnut. They said that groundnut has been christened as a 'wonder nut' on account of its multiple uses.

They were of the opinion that, over the last few decades this Wonder Nut has not received much importance as compared to other oilseeds like Soya, but off late due to COVID and the huge upsurge in edible oil prices worldwide has once again brought the focus back on this important oilseed. To give Groundnut its due, SEA along with IOPEPC supported by CLFMA and SOMA decided to conduct this webinar.

Groundnut occupies a very important place in the Oilseed basket of India. He further said, with the opening up of the oil imports under OGL in nineties the pre-eminent position of Groundnut got seriously compromised. It would come as a shock to many, that Groundnut, which contributed about 60% in India's overall edible oil consumption in Seventies now is now less than 1.5% of our consumption. The solvent plants engaged in Groundnut have long

been either scrapped or diverted to other oilseeds. The onslaught of imported oils at practically NIL duty in the last two decades gradually sounded the death knell of Groundnut oil. The situation now has undergone a sea change. Years of neglect of our oilseed cultivation by the decision makers who were lulled into complacency by low world prices ended up, creating a situation where 70% of our consumption is now dependent on imports. No nation can afford to compromise its edible oil security to such an extent and this realization is getting driven in the minds of our policy makers with the unprecedented price rise of last few months.

Groundnut is bound to benefit with prices ruling much above MSP and after a very long time Groundnut oil is selling at par or lower than imported oil. Exports of ground nut oil are booming and India will end up exporting in excess of 2.40 lakh mts of oil, which is an all-time record. Even the exports of HPS are booming and we would see exports of close to 6.00 Lakh mts.

At SEA, they had mentally started treating Groundnut as a dry fruit as opposed to being an oilseed. However, the recent changed equation has once again stressed the importance of Groundnut if India has to achieve the concept of Atmanirbharta in edible oils. Being a high oil-bearing oilseed like mustard with a very strong acceptability in our country time has come to promote it big time & we are happy to state that GOI. has included Groundnut promotion as one of their main agenda under National mission on edible oilseeds.

To give Groundnut the required thrust SEA has decided to promote Groundnut on a war footing and once again help create the right eco-system, which will promote this important oilseed.

As the Hon'ble Prime Minister is from GUJARAT, we trust the required push at policy level would be given by the agriculture ministry.

Key Note address was delivered by Shri. Sudhanshu Pandey, Secretary (F&PD), Min. of Consumer Affairs, Food and Public Distribution, Govt. of India on the Topic "National Mission on Oilseeds with special reference to Groundnut".

A Special Address was delivered by Smt. Shubha Thakur, Jt. Secretary (Oilseeds), Dept. of Agriculture & Cooperation, Min. of Agriculture, Govt. of India on the Topic "Atmanirbhar in Oilseeds – A Way Forward".

Special Presentations was delivered by **Shri Angshu Mallick - MD & CEO, Adani Wilmar Ltd** on "Rebranding of Groundnut Oil as Premier Cooking Oil". **Shri Kishore Tanna - Chairman, SEA Groundnut Promotion Council** delivered an excellent presentation on "Export Potential for HPS Groundnut, Groundnut Oil and Meal".

CLFMA Technical Expert & Consulting Animal Nutritionist Shri Pradeep P. Mahajan delivered and useful and excellent presentation for the Livestock Industry on the topic "Groundnut Extraction – Usage in Feed Formulation" & in the end **Shri Tushar Thumar - Director, Shreeya Peanuts Pvt. Ltd** delivered presentation on the useful topic " Addition in Groundnut Chain".

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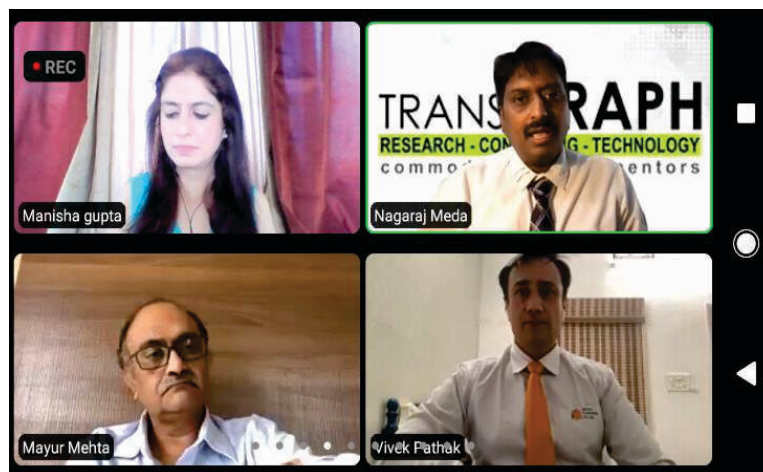
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After that, there was a panel discussion on the Topic “Price Outlook for Edible Oil with Special reference to Groundnut Oil” **Smt. Manisha Gupta** – Editor-Commodity & Currency, CNBC TV18 & CNBC Awaz moderated the session successfully. Panel Members present for the Session were **Shri. Atul Chaturvedi** - President, SEA, **Shri. Govindbhai Patel** - Managing Partner, GGN Research, **Shri Priyam Patel**- VP , N.K. Proteins Pvt. Ltd., **Shri Nagaraj Meda** - MD, TransGraph Consulting Pvt. Ltd., **Shri. Mayur Mehta** - Editor, Commodity World, **Shri Vivek Pathak** - Director, Athena Tradewinds Pvt. Ltd., **Shri Mukesh Nathwani** - Chairman, Gulab Oils & Foods Pvt. Ltd.

Key objective of the Webinar was to discuss on demand of peanut oil and realizing its nutritional benefits. Peanut Oil is consumed as Raw / Virgin / First Press / Natural Oil in the States of Gujarat, Maharashtra, Tamilnadu, Telangana and Andhra Pradesh. Although India has a share about 20% in World Markets (About 7 Lakh Tons), its share in EU is less than 1% (About 7000 Tons). Argentina and US are dominant suppliers with major share of EU market. EU has fixed very stringent levels of Aflatoxin (2/4ppb) for Ground nuts which acts as a Non-tariff barrier. IOPEPC has pitched for rationale limits in Codex (10 ppb). EU offers a tremendous potential for growth for Indian Exports, which can be achieved by fixation of 10 ppb Aflatoxin limits.



Dr. B. V. Mehta, Executive Director of SEA of India concluded the webinar by thanking the panelists for their valuable inputs and the audience for participating and making the event a success.

CLFMA OF INDIA will support and organize for more such programs for the benefit of the feed industry at large and livestock sector as a whole in future as well.

The webinar attracted interest not only from India but also internationally. Almost 500 delegates attended the Webinar from India and almost from 20 other Countries. Total registrations for the event were 522.



Bioremediation: A Management Tool for Polluted Environment

M. F. Panthi¹, N. K. Suyani^{2*} and Varsha Likhar¹

Introduction

Environmental pollution is increasing in the past few decades owing to rapid industrialization, large-scale anthropogenic activities on energy reservoirs and unsound farming practices. World population is expected to increase from 7 billion today to over 9 billion in 2050 (OECD, 2012). A growing population is likely to increase pressures on the natural resources that supply energy and food. The intensive agricultural and industrial systems needed to support such a large number of population will inevitably cause an accumulation of soil, water and air pollution. Bioremediation is a branch of biotechnology that employs the use of living organisms. It is an integral part of all the environmental biotechnology program that explores the use of biological mechanisms to destroy, transform or immobilize environmental contaminants to protect potential sensitive receptors (Panigrahi *et al.*, 2015). The use of living organisms (microbes and bacteria) is materialized as one of the most useful alternative technologies for the degradation of hazardous chemicals, contaminants, pollutants, and toxins from soil, water, and other environments. Often the microorganisms metabolize the chemicals to produce carbon dioxide or methane, water and biomass. Alternatively, the contaminants may be enzymatically transformed to metabolites that are less toxic or innocuous. Thus the natural biological processes can be explored to remediate nutrient rich water by converting nutrients in to forms that can be more easily removed.

Principle

Bioremediation relies on stimulating the growth of certain microbes that utilize contaminants like oil, solvents, and pesticides as source of food and energy. These microbes convert contaminants into small amounts of water, as well as harmless gases like carbon dioxide. The process of bioremediation enhances the rate of the natural microbial degradation of contaminants by supplementing the indigenous microorganisms (bacteria or fungi) with nutrients, carbon sources, electron donors (bio-stimulation/bio-restoration) or by adding an enriched culture of microorganisms that have specific characteristics that allow them to degrade the desired contaminant at a faster rate (bio-augmentation).

This technique requires a combination of the right temperature, oxygen and nutrients. The absence of these elements may prolong the cleanup of contaminants. Conditions that are unfavorable for bioremediation may be improved by adding “amendments” to the environment, such as molasses, vegetable oil, or simple air. These amendments optimize conditions for microbes to flourish, thereby accelerating the completion of the bioremediation process. The suitable organisms can be bacteria, fungi, or plants, which have the physiological abilities to degrade, detoxify, or render the contaminants harmless. In some occasions, the microorganisms can be already present on the site (indigenous microorganisms), or can be isolated from elsewhere and added to the treated material, using bioreactors as an example.

Classification

Bioremediation technique relies on biological mechanisms to degrade concentration of pollutants to a non-toxic state. Nature of pollutant, depth and degree of pollution, type of environment, location, cost, and environmental policies are the some of the key selection criteria that are considered while choosing any bioremediation technique (Frutos *et al.*, 2012; Smith *et al.*, 2015). Performance criteria (oxygen and nutrient concentrations, temperature, pH, and other abiotic factors) that determine the success of bioremediation processes are also given major considerations prior to bioremediation project apart from selection criteria.

Apparently, taking into consideration site of application, bioremediation can be categorized into two major techniques: In-situ bioremediation and Ex-situ bioremediation.

In-Situ Bioremediation: It refers to bioremediation at the contamination site itself. It is the process whereby contaminants are biologically degraded under natural conditions to either carbon dioxide, and water or an attenuated transformation product. It is a low cost, low maintenance, environment-friendly, and sustainable approach for the clean-up of the contaminated natural surroundings. The benefit of in situ treatment is that it prevents the spread of contamination during the displacement and transport of the contaminated material. In

situ bioremediation is an attractive option for groundwater with lower contaminant concentrations because the treatment occurs directly in the subsurface aquifer. Some of the in situ bioremediation practices are Biosparging, Bioventing, Bioaugmentation, Biopiling, etc.

Ex-Situ bioremediation: It refers to treatment that occurs after the contaminated waste has been removed and taken to a treatment area. If we take the example of contaminated soil, the soil may be removed and transported to an area where the bioremediation methodologies may be employed. Ex-situ bioremediation may be necessary if the climate is too cold for microbe activity, or the soil is too dense for nutrients to be spread evenly. The main advantage of ex-situ bioremediation is that it helps to contain and control the bioremediation products, as well as making the area that was contaminated available for use. On the other hand, this entire process is expensive and requires good maintenance of the treatment plant.

Based on type of organisms used the bioremediation is categorized into three types: microbial remediation, phyto-remediation and myco-remediation.

Microbial remediation: Microorganisms are well known for their ability to break down a huge range of organic compounds and absorb inorganic substances. Currently, microbes are used to clean up pollution treatment in processes known as bioremediation. Different microbial systems like bacteria, fungi, yeasts, and actinomycetes can be used for removal of toxic and other contaminants from the environment. They are readily available, rapidly characterized, highly diverse, omnipresent, and can use many noxious elements as their nutrient source. They can be applied in both in situ and ex-situ conditions; in addition, many extreme environmental conditions can be cleaned by such entities. Although many microorganisms are capable of degrading crude oil present in soil, it has been found beneficial to employ a mix culture approach than the pure cultures in bioremediation as it shows the synergistic interactions (Das and Dash, 2014). Different bacteria can be used for the removal of petroleum hydrocarbon contaminants from soil. The bacteria that can degrade major pollutants include *Pseudomonas*, *Aeromonas*, *Moraxella*, *Beijerinckia*, *Flavobacteria*, *Chrobacteria*, *Nocardia*, *Corynebacteria*, *Acinetobacter*, *Mycobactena*, *Modococci*, *Streptomyces*, *Bacili*, *Arthrobacter*, *Aeromonas*, and *Cyanobacteria*.

Phytoremediation: It works with the natural capabilities of plants to repair and regenerate toxic soils, groundwater and surface water. Plants can help bind, extract, transform and clean up many kinds of pollution including metals, pesticides,

chlorinated solvents, polychlorinated biphenyls (PCBs), explosives, radionuclides and petroleum hydrocarbons. Plants clean up these forms of pollution as far down as their roots can grow. Plants also help prevent wind and rain from carrying pollution away from the site to other areas. There are seven different ways that plants can remove contaminants i.e. Phytoextraction, Phytodegradation, Phytovolatilization, Rhizofiltration, Phytostabilization, and Phytotransformation (Harekrushna and Kumar, 2012).

Mycoremediation: It is derived from two words "Myco-" means related to fungi, and "remediation" means to restore or repair something to its original state. It is technique in which fungi are used to break down environmental contaminants. Fungi are powerful planetary healers and disaster responders. They are nature's decomposers, responsible for breaking down most of the earth's plant and woody material into life giving soil. Just like they break down complex carbon based plant cell structures, like cellulose and lignin, saprophytic fungi use their digestive enzymes to break down chemicals like hydrocarbons and pesticides. Fungi can break down larger hydrocarbon chains into smaller pieces, allowing for microorganisms and plants to get to work. Fungi can also extract and hyper-accumulate heavy metals, concentrating them in the fruiting body of the fungi (mushroom).

Factors affecting microbial bioremediation

The bioremediation process may last from several months to years to complete, depending on variables such as the size of the contaminated area, the concentration of contaminants, temperature, soil density, and whether bioremediation will occur in situ or ex situ. For example, bioremediation will take longer where contaminant concentrations are high (or contaminants are trapped in hard-to-reach areas, like rock fractures and dense soil), area is large or deep and cleanup occurs ex-situ.

The effectiveness of bioremediation depends on several factors like the chemical nature and concentration of pollutants, the physicochemical characteristics of the environment, and their availability to microorganisms. Furthermore, microbes and pollutants are not uniformly spread in the environment. The controlling and optimizing of bioremediation processes is a complex system due to the existence of a microbial population capable of degrading the pollutants, the availability of contaminants to the microbial population and environment factors. The major factors that directly or indirectly alter the process are listed below (Abatenh et al., 2017a):

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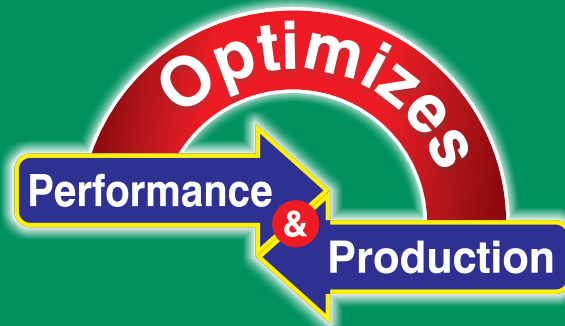
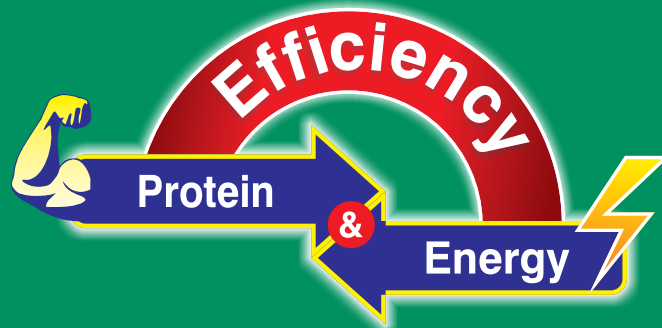
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- Biological factors
- Environment factors
- Availability of nutrients
- Temperature
- Concentration of oxygen
- Moisture content
- pH
- Site characterization and selection
- Toxic compounds
- Metal ions

Advantages

Bioremediation is an organic process. It is a cost-effective technique to maintain and economical to input, has lowers liability, as contaminants are less likely escape, requires little energy consumption compared to incineration and landfilling. It is having high public acceptance and also from regulatory authorities. It requires a very less effort and can often be carried out on site, often without causing a major disruption of normal activities. It helps in complete destruction of the pollutants, many of the hazardous compounds can be transformed to harmless products, and this feature also eliminates the chance of future liability associated with treatment and disposal of contaminated material. It almost has no harmful side effects, can be carried out in situ for most applications with no dangerous transport, minimal equipment are needed except for specialized pieces. It does not use any dangerous chemicals. Nutrients especially fertilizers added to make active and fast microbial growth (Abatenh et al., 2017b). It is a natural process, it takes a little time, as an acceptable waste treatment process for contaminated material such as soil. The residues for the treatment are usually harmless product including water carbon dioxide and cell biomass.

Limitations

Bioremediation is limited to those compounds that are biodegradable. Not all compounds are susceptible to rapid and complete degradation. This process sometimes may not reduce concentration of contaminants to required levels. It often takes longer than other treatment options, such as excavation and removal of soil or incineration. Amendments introduced into the environment to enhance bioremediation may cause other contamination problems. There are concerns that the products of biodegradation may be more persistent or toxic than the parent compound. Regulatory uncertainty remains regarding acceptable performance criteria for bioremediation. Evaluating performance of bioremediation is difficult, and there are no acceptable

endpoints for bioremediation treatments (Abatenh et al., 2017b). Biological processes are often highly specific. Important site factors required for success include the presence of metabolically capable microbial populations, suitable environmental growth conditions, and appropriate levels of nutrients and contaminants.

Prospects

It is clear that microorganisms play crucial role in bioremediation; therefore, their diversity, abundance and community structure in polluted environments provide insight into the fate of any bioremediation technique provided other environmental factors, which can impede microbial activities are maintained at the optimal range. Bioremediation techniques are diverse and have proven effective in restoring sites polluted with different types of pollutants. Nutrient limitation, low population or absence of microbes with humiliate capabilities, and pollutant bioavailability are among the major pitfalls, which may hinder the success of the technique. Since bioremediation depends on microbial process, there are two major approaches to speed up microbial activities in polluted sites, namely: biostimulation and bioaugmentation (Azubuike et al., 2016). Research is needed to develop and engineer bioremediation technologies that are appropriate for sites with complex mixtures of contaminants (solids, liquids and gases) that are not evenly dispersed in the environment.

Conclusion

Biodegradation is an alternative to traditional physicochemical techniques for the remediation of organic pollutants at contaminated sites. It is an attractive and fruitful option for remediating, cleaning, managing and recovering technique for solving polluted environment through microbial activity. Microorganisms with suitable and stable genetic traits, and efficient and effective biodegradation processes would be helpful for clean and green environment. Generally, different species are explored from different sites and they are effective in controlling the process. Bioremediation has been used in different sites globally within varying degrees of success. Mainly, the advantages are greater than that of disadvantages which is evident by the number of sites that choose to use this technology and its increasing popularity through time.

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Promising Prospect of Livestock Sector in India

Priti Saha¹, Jui Lodh² and D.C. Sen³

Introduction

India's livestock is one of the prime sectors in the world. It plays a vital role in the rural economy and nutrition of both small and marginal farmers. About 67% of small and marginal farmers including landless people own about 70% of livestock in India. Besides providing high quality animal protein, livestock utilizes non-edible agricultural by-products and provides raw materials such as hides, skin, bones, fat, etc. Livestock sector also provides employment to about 8.8% of the total population in India and contributes 4.11% GDP and 25.6% of total Agriculture GDP.

Role of livestock sector is in up-gradation of the low yielding stock of all species of economically important domesticated animals through Artificial Insemination & other breeding practices apart from supply of exotic germ plasm of high yielding variety of livestock & birds from its breeding farms. It also renders Veterinary services for Curative & Preventive health care for animals & birds through its intensive network of Veterinary hospitals, Veterinary dispensaries, Veterinary sub-centres, and Disease investigation laboratories, etc. for protection of Livestock health in India.

In spite of hurdles in respect of high feed cost and scarcity of improved variety of animal husbandry inputs, considerable interest has been developed among both rural and urban people in taking up modern A.H. practices with high yielding variety of livestock and birds such as piggery, broiler, goat, sheep and dairy farming as subsidiary as well as main economic activity.

Major Challenges

The livestock sector in India faces the following major challenges which need to be addressed enabling this to grow according to its potential:

Shortage of Feed and Fodder: With increased livestock population, the gap between the requirement and availability of feed and fodder are increasing mainly due to reducing area for fodder cultivation as well as reduced availability of crop residues as fodder. There is continuous shrinkage of common property resources leading to over grazing in the existing grasslands. It is very crucial to arrange sufficient good quality

feed and fodder for efficient utilization of genetic potential of the various livestock species and for sustainable improvement in productivity.

Low Productivity: Although India is a major producer of livestock products, the average productivity of livestock is lower than the world average. Inadequate availability of feed and fodder, insufficient coverage through artificial insemination, low conception rates, non-availability of quality males for breeding, poor management practices, high mortality and morbidity losses due to diseases, poor marketing infrastructure and unorganized marketing are the other major concerns.

Livestock Health: A large number of infectious and metabolic diseases prevalent in Indian livestock have serious association for animal productivity, export potential and safety or quality of livestock products. Many of these diseases have zoonotic implications. The current efforts of prevention and control of livestock diseases needs to be strengthened.

Inadequate Infrastructure for Marketing, Processing and Value Addition:

The livestock sector is handicapped due to lack of marketing and processing infrastructure. As a result primary producers do not get remunerative prices most of the times. Although various initiatives for dairy development have been taken by vibrant dairy cooperatives in many States, but still large number of dairy farmers are not covered. The dairy cooperatives handle only about 8% of the total milk production. Major share of marketable surplus of milk and other livestock products are not handled by the organized processing industry, resulting in reduced price realization by farmers and post production losses and wastages.

Strategy for Enhancing Livestock Production

Milk

The yield for cows and buffaloes need to be improved through increased availability of feed and fodder, genetic up-gradation through cross breeding, strengthening progeny testing, selective breeding, converting unproductive animals to productive and improved disease control, surveillance, etc. The problem of infertility among improved milch animals has

to be suitably addressed through provision of area specific mineral mixture with appropriate feed and fodder besides better animal husbandry practices.

Meat

Emphasis on small ruminants and pigs are required to improve nutrition, genetics for better feed conversion ratio, breeding strategies and health cover to increase prolificacy and reduce mortality leading to better quality and quantity of meat.

Egg and Poultry

The commercial poultry sector is highly organized and a substantial part of the production of germ plasm, feed and vaccines, etc., are being undertaken by the private sector. The backyard poultry produces 30 to 35% of the eggs give nutritional securities to the rural poor, is, however, facing many problems. Appropriate support should be provided to this sector in the form of financial assistance, genetic stocks and improved technologies, scientific advice, extension/awareness, particularly on bio-security measures. Conservation of indigenous poultry breeds has to be encouraged for producing poultry birds suitable for backyard poultry. Focus has to be given to promote clusters or small holder's poultry estate in rural areas.

Remunerative marketing opportunities to farmers, mutually beneficial contracts between the poultry farmer and purchaser including poultry industry have shown courage to minimize the risks of the farmer. Formation of integrated model through the association of corporates with self-help groups or co-operatives may come up with a lot of opportunities to small farmers.

Meat Production and Processing

Apart from often being cruel, unorganized slaughter some time may cause environmental and public health issues. Integrated modern abattoirs has to be encouraged and taking into account the legal regulatory provisions for production of quality meat, to ensure zero environmental pollution, minimize wastage of by products, utilize edible and inedible by products, prevent undue cruelty to animals and to promote use of humane methods of slaughter. The regulatory mechanism for quality meat production has to be synchronized with global health standards for domestic consumption and export purposes.

Feed and Fodder

Enrichment of Straw Quality

Straws, crop residues, stovers and other agricultural by-

products are likely to continue to be major input as livestock feed for ruminants. To avoid wastage of large quantity of straw and agro-industrial by-products, enrichment and densification of crop residue to be encouraged by using existing and newly developed technologies. Biotechnological techniques for production of recombinant microbes to digest straws, utilize lignin and its by-products and release of carbohydrates through a solid state fermentation process, should be developed by involving research organizations of government and private sector.

Cereals and Oil Meals

The utilization of area under cultivation of coarse grains over the years resulting in shortage of feed ingredients and concentrates. Efforts should be made to enhance availability of coarse grains and oil meals for livestock and poultry sector. Steps to be taken in consultation with agriculture department to increase area under high yielding/hybrid varieties of coarse grains. Non-conventional animal feed resources has to be exploited to make available protein and energy for livestock feeding.

Production of Fodder and Fodder Seeds

Efforts to be made to increase production of quality fodder seeds through necessary incentives, arranging foundation seeds of different high yielding fodder varieties and modern scientific farming procedures, etc. Fodder cultivation area should be increased, especially through use of barren and fallow lands and silviculture. Pertinent resources and technologies will be made available to ensure quality fodder seed production. In this regard, degraded land, forest land may be utilized for fodder cultivation with the help of farming community. Round the year availability of quality fodder through promotion of hay, silage and fodder banks, etc. should be emphasized. Non-conventional sources of feed like azolla, processed vegetables and fruit wastes, etc. can be promoted.

Compound Feed and Balanced Ration

The quality of compound feed is most important for enhancing production and productivity as well as farm economics. Standards have been developed for compound feed for various species of livestock, including cow, buffalo, pigs, sheep, goats, camels and balanced ration with locally available ingredients to be encouraged. The livestock and poultry owners should be educated regarding the benefits of quality feed, balanced ration, bypass protein and bypass fat. Quality of packaged balanced feeds should be compliance with BIS standards. Use of special feed supplements, area

specific mineral mixtures and ration balancing have to be promoted.

Development of Pasture Land and Common Property Resources

Common property resources available for grazing in rural areas have not only shrunk in size but also become less productive due to negligence and overgrazing. Physical availability and production potential of pastures and grazing community lands has been assessed and steps to be taken to rejuvenate such lands by planting fodder trees and grasses. Integrated farming should be encouraged through Panchayati Raj Institutions.

Dairying

Strengthening Infrastructure and Handling Capacity

Presently about 16% of milk produced in India is handled by organized sector. Efforts to be made to set up collection centres along with milk routes to increase milk procurement. To ensure higher milk production, the efforts and resources of both cooperative and private sectors need to be synergized. By creating a facilitating environment, self-sustaining viable dairy units have to be promoted. For improvement of quality milk production, necessary veterinary support, infrastructure and cold chain facility need to be expanded.

Strengthening Dairy Cooperatives

Greatest strength of the cooperatives has been their primary milk producers as well as the rural procurement structure. Focus should be given to strengthen their rural base. Since cooperatives carry major share of the organized dairy business in India, effective steps to be taken to make them financially viable. Dairy cooperatives have to be assisted to expand their milk routes, procurement infrastructure and processing capability and have to be encouraged to provide breeding and veterinary services to farmers.

Clean Milk Production, Hygiene and Quality Control

There is a growing concern on excessive residues of fertilizers, pesticides, antibiotics and other non-biological toxicants in milk and milk products. The policy "Clean milk production" is set for production of safe and quality milk not only to meet international standards but also to benefit farmers and consumers. The modernized methods of collection, storage, transport, processing and testing of milk with administrative and regulatory approach ensure supply of safe milk as per the standard quality. These need to be supported by a network of internationally accredited laboratories with application of total quality management.

Animal Health

Veterinary Services

Available veterinary hospitals, dispensaries, Aid centers, diagnostic laboratories and veterinary manpower are much less than required. These services required to be improved and expanded. Private investment to improve animal health service facilities should be encouraged. Mobile veterinary dispensaries with provision for vaccination and facilities to generate awareness of farmers regarding various livestock management issues have to be promoted to improve outreach.

Disease surveillance and forecasting

There is a need to establish effective and integrated surveillance, vigilance, prevention and control mechanisms designed to protect the productivity and safety of farm animals, an efficient forecasting and management information system on occurrence of diseases. Prompt collection and validation of animal disease information and creation of database might help in launching of various disease control programs.

Animal Biosecurity

States required to be encouraged to promote responsible use of antibiotics and other medicines harmful to the environment. Necessary legislative back-up for enforcement of biosecurity, strong quarantine facility, appropriate risk analysis and risk mitigation will be integrated in the system.

Animal Welfare

Welfare of animal is an integral part of livestock production system. Compliance of existing Laws of land on animal welfare will be ensured at every stage of value chain including production, transportation, slaughter, care of draught animal and animal handling.

Conclusion

Besides providing animal protein, in India livestock sector, contributes livelihood for about two-third of the rural people. Therefore, there is an ample scope of livestock sector in India which needs to be explored in full swing and whole heartedly by all of us.

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Application of Nano Minerals in Livestock Feeding

Movaliya J.K. Brishketu Kumar*, Thakur K S Rao and Dinesh Kumar

*College of Agriculture, NAU, Bharuch, Gujarat

INTRODUCTION

Indian dairy cattle are an important livestock species in India and are primarily reared for milk. India continues to be the largest producer of milk in the world. Country has projected milk production to increase to 208 million tons (MT) in FY21 from 198 MT in FY20 and 187.7 MT in FY19 with the increase in milk production. The government has a milk production target of 300 MT by FY24 to meet the growing demand for dairy products and to make dairying a sustainable source of livelihood for small and marginal farmers and landless labourers that constitute the bulk of milk producers in India.

AVERAGE MILK YIELD

India is blessed with a huge biodiversity of 43 indigenous cattle breeds and 16 Buffalo breeds which have survived in respect of their suitability for specific purposes in the concerned local environment. The strategy is thus to enhance the average productivity of milk of selected breeds from the overall available breed types (e.g. Gir for high milk productivity) from the present level of 4.85 kg/day to 6.77 kg per day per indigenous animal.

Nutrition plays a key factor in improving the productivity of Indian dairy animals. Micro nutrient especially mineral deficiency is common in Indian dairy cattle foraging on poor quality pasture. Mineral supplementation is thus critical in rations of cattle and buffalo. Insufficient mineral supplementation can reduce their performance with serious economic impact, while over supply does not benefit the animal and is damaging to the environment. Mineral mixtures available for ruminants in India contain all the essential minerals required, though some of the minerals are available in the fodder they consume. Minerals play a vital role in the dairy industry. Minerals perform digestive and biosynthesis process and help in growth of animals. Mineral are of two types, i.e., major or macro-minerals [Calcium (Ca), Phosphorus (P), Magnesium (Mg), Sodium (Na), Potassium (K), Sulphur (S) and Chloride (Cl)] and trace or micro-

minerals [Iron (Fe), Copper (Cu), Zinc (Zn), Cobalt (Co), Manganese (Mn), Iodine (I), Selenium (Se) etc.,]. Overfeeding of minerals results in hormonal imbalance and affects the production performance of dairy animals. Mineral supplementation should be done keeping in view the physiological conditions of the animals.

MINERALS BIOAVAILABILITY

The bioavailability of a mineral in a particular source is determined relative to its functional availability from a standard source. Use of a standard source allows expression of bioavailability in terms of relative biological availability. Bioavailability can be affected by a number of factors including animal species, physiological state, previous nutrition, interactions with dietary nutrients and ingredients, choice of response criteria, choice of standard source, and chemical form and solubility of the mineral element among the factors, interaction between two minerals or more minerals can reduce bioavailability tremendously. Mineral interactions is defined as "interrelationships among mineral elements as revealed by physiological or biochemical responses" and the interaction could be either positive (commonly synergistic) or negative (antagonistic). A high concentration of an antagonist element decreases the biological effectiveness of its target element. The interactions between minerals can affect each components bioavailability and two or more components may be affected simultaneously. The following are the commonly encountered minerals interaction in domestic animals.

1. Copper-Molybdenum-Sulfur
2. Copper-Sulfur
3. Copper-Iron
4. Selenium-Sulfur

Several technologies are adopted to increase the bioavailability of the minerals; nano mineral is one among them. Nano minerals improve bioavailability due to the

increase in the surface area. Further, nanoencapsulation technique avoids mineral-mineral or mineral-nutrient interaction and enhances their availability.

Nanotechnology is a field of convergence among life sciences, material science and information technology. It is intended to manipulate at atomic level and thus processes and products evolved from it will be more precise and it will be hardly possible to achieve through conventional systems. It has revolutionized electronics, energy, environment and health sectors that enabled the development of processes and products, which are considered impossible with traditional systems. Despite its importance is imminent, we still begin to scratch the surface in animal sciences. Little research work has been done to explore the efficacy of the nano minerals. Bioavailability of the minerals can be enhanced by increasing the surface area. Nano minerals are used for enhancing the bioavailability in livestock industry. They can be synthesized by physical, chemical and biological means.

SYNTHESIS OF NANO MINERAL PARTICLES

Since 1956, from the conception of idea by American physicist Richard Feynman, inspiration for the field of nanotechnology has started. Research on nano particles developed into an important field of modern research with potential effects in electronics to medicine and recently in agriculture and livestock industry. Nanotechnology can be defined as 'manipulation of (designing, synthesis) particle with dimensions less than a micron to that of individual atom'. Nanoparticles present a higher surface volume with decreasing size of the particle. Nanoparticles exhibit unique properties in terms of chemical, physical, photo-electrochemical and electronic properties when compared to their respective bulk materials. All these applications require customized synthesis methods for specific applications. Nanotechnology holds promise for medication and nutrition because materials at the nanometer dimension exhibit novel properties different from those of both isolated atom and bulk material. Nano-structured metal particles can be synthesized either by the "top down method", i.e., by the mechanical grinding of bulk metals (physical method), or via "bottom-up method" which rely on the wet chemical reduction of metal salts (nucleation and growth of metallic atoms). Recently, integration of biological components in the formation of nano sized particles leading to the complete green synthesis of nanoparticles has emerged as novel method and gaining more importance among researchers. For the synthesis of nanoparticulate metal colloids, a large

variety of stabilizers, e.g. donor ligands, polymers and surfactants are used to control the growth of the initially formed nanoclusters and to prevent them from agglomeration.

APPLICATION OF NANO MINERALS IN LIVESTOCK FEEDING

Nano minerals for animal production research works have been started to explore the efficacy of the nano minerals in livestock and agricultural industry concluded that supplementing diets with 0.30 mg/kg of nano-Se was effective in increasing the growth performance and feed conversion ratios in poultry, the Se content of tissues, and the quality of the meat. The supplementation of Se improved growth performance and Se concentration in blood and tissues in growing male goat. Dietary supplementation of elemental nano-Se could be utilized more effectively when compared to inorganic or organic Se. The incorporation of different Se forms (sodium selenite, selenized yeast and elemental nano-Se) into growing goat diet increased Se concentrations in whole blood, serum and tissues.

Supplementation of nano selenium in crucian carp (*Carassius auratus gibelio*) has improved body weight than control group. Similarly, highest value of selenium content in muscle was observed in nano selenium supplemented group. Nano-Se supplementation in basal diet improves rumen fermentation and feed utilization. Nano-Se could also stimulate rumen microbial activity, digestive microorganisms or enzyme activity. The optimum dose of nano-Se was about 3.0 g/kg dietary DM in sheep.

In one study Nano chromium supplementation significantly decreased serum concentrations of insulin and cortisol, increased serum levels of insulin-like growth factor I and immunoglobulin G, and enhanced the lympho proliferative response, and phagocytic activity of peritoneal macrophages. It has been reported that supplementation of Cr in the form of Cr-nano and CrPic might be an effective tool for enhancing the growth performance and carcass traits of broiler chicks in heat-stressed condition. Cr-nano seemed to have greater beneficial effects in comparison with CrPic.

It has been observed in cattle that the supplementation of nano zinc oxide had improved milk production in subclinical mastitis. It has been observed that increase in milk production, suppression of subclinical mastitis (reduction in somatic cell count) by nano zinc supplementation to dairy animal. It could be useful feeding strategies.

NANO MINERALS FOR IMPROVING IMMUNITY

Supplementation of nano zinc has drastically reduced SCC in subclinical mastitis cow and improved mastitis condition with increase in milk production than macro zinc oxide. Similarly, it has been observed that glutathione peroxidase (GSH-Px) activities in carp's plasma and liver of nano selenium group and selenomethionine were significantly improved with that of the control. Antioxidant status was also improved by Se supplementation. In many research it has been observed that supplementation of nano Se improves growth performance, serum oxidant status and Se concentration in blood and tissues in growing male goat. The dietary supplementation of elemental nano-Se could be utilized more effectively in growing male goat when compared to inorganic or organic Se.

NANO MINERALS FOR ANIMAL REPRODUCTION

Effect of nanoparticles on reproduction is scanty. However enormous scope is available to explore the effect of nano particles on reproduction. Nano sensors are available to study the causes of abortion. Nano anti-oxidant is one of the areas to be explored to prevent retention of placenta and other reproductive problems after calving and also for improving

infertility problems. Some of the nano particles need to be explored to include in the semen extender to improve the quality of the semen e.g., Nano- Se, Nano Zn. The penetration of gold nano-particle into the sperm heads and tails was observed. After mixing the semen with a gold nano-particle solution, 25% of spermatozoa became non-motile. In goats, selenium deficiency resulted in abnormal spermatozoal mitochondria. Supplementation of nano-se in goat's enhanced the testis Se content, testicular and semen GSH-Px activity protected the membrane system integrity and the tight arrangement of the mid-piece of the mitochondria.

CONCLUSION

Several technologies have been adopted to increase the bioavailability of the minerals; nano mineral is one among them. Nano minerals improve bioavailability due to the increase in the surface area. Studies so far have indicated that the application of nano minerals in animal production, immunity and reproduction is promising. Application of nano-minerals is immense but the safety in application of nanominerals needs to be assessed before it being applied in the livestock industry.



Interaction of Vitamins with Infections

Prachurya Biswal^{1*}, Bibhudatta S. Panda², Swagatika Priyadarshini¹, Priya Dhatarwal¹

Introduction

A vitamin is an organic molecule (or related set of molecules) as well as an essential micronutrient that an organism needs in small quantities for the proper functioning of its metabolism. Essential nutrients cannot be synthesized in the organism, either at all or not in sufficient quantities, and therefore must be obtained through the diet. Vitamins have diverse biochemical functions. Vitamin A acts as a regulator of cell and tissue growth and differentiation. Vitamin D provides a hormone-like function, regulating mineral metabolism for bones and other organs. The B complex vitamins function as enzyme cofactors (coenzymes) or the precursors for them. Vitamin C and E function as antioxidants. Both deficient and excess intake of a vitamin can potentially cause clinically significant illness, although excess intake of water-soluble vitamins is less likely to do so. Infection is the invasion of an organism's body tissues by disease-causing agents, their multiplication, and the reaction of host tissues to the infectious agents and the toxins they produce.

Effect of vitamin A on infection

Vitamin A (Vit A) is a group of unsaturated monohydric alcohols that contain an alicyclic ring. Vit A is insoluble in water but is fat soluble (Sommer, 2008). In 1928, Green and Mellandy reported that Vit A could enhance the anti-inflammatory response of organisms and called Vit A the "anti-inflammation vitamin" (Mellanby, 1928). Later, the anti-inflammatory capacity of Vit A was widely studied in the 1980s and 1990s. Vit A exists in the form of retinol, retinal, and retinoic acid (RA), among which RA shows the most biological activity. RA exists in two significant derivatives: 9-cis-RA and all-trans-RA (ATRA). The primary biological functions of Vit A include maintenance of vision, growth, and the integrity of epithelial and mucous tissue. However, the immunoregulatory mechanisms of Vit A are not entirely understood.

Vit A and Its Impact on the Immune System

Immune system consists of organs or tissues where most immunocompetent cells proliferate, differentiate, mature, aggregate, and respond to immunity. Research has shown that crucial immune organs need constant dietary intake to

maintain Vit A concentrations, and RA was previously shown both to promote the proliferation and to regulate the apoptosis of thymocytes. In the thymus, endogenous retinoid synthesis and retinoids similar to glucocorticoids might, indeed, be involved in the regulation of thymic proliferation and selection processes, by being present in the thymus in functionally effective amounts (Kiss et al., 2008). In mice, Vit A and D leads to a defect in both T cell-mediated and antibody-dependent immune responses (Bennekum, 1991). Infection is often an early complication and leads to substantial mortality prior to the development of exophthalmia. Vitamin A-deficient animals raised under germ-free conditions develop many of the classic keratinizing lesions of Vitamin A deficiency but continue to survive. In contrast, equally Vit A-deficient littermates raised in a conventional environment acquire infection and die prematurely (Glass, 2000). It is reported that vitamin A plays a pivotal role in maintaining resistance to infection. As the interdisciplinary approach continues to develop in research, people have been paying increasing attention to the relationship between nutrition and immunity. Furthermore, the influence of micronutrients on the immune function of the organism has been widely studied. Vit A has both promoting and regulatory roles in both the innate immune system and adaptive immunity; therefore, it can enhance the organism's immune function and provide an enhanced defence against multiple infectious diseases. Currently, the Vit A's effect on immune function has been studied at the molecular level, and more research is ongoing about the therapeutic effects of Vit A on preventing and curing various infectious diseases. As increasing evidence appears with time, Vit A will likely play more critical roles in modern therapeutics.

The Role of Vitamin D in Prevention and Treatment of Infection

Vitamin D is well known for its classic role in the maintenance of bone mineral density. However, vitamin D also has an important "non-classic" influence on the body's immune system by modulating the innate and adaptive immune system, influencing the production of important endogenous antimicrobial peptides such as cathelicidin, and regulating the inflammatory cascade. Multiple epidemiological studies

in adults and children have demonstrated that vitamin D deficiency is associated with increased risk and greater severity of infection, particularly of the respiratory tract. Although the exact mechanisms by which vitamin D may improve immune responses to infection continue to be evaluated, vitamin D supplementation trials of prevention and adjunct therapy for infection are underway. Given its influence on the immune system and inflammatory cascade, vitamin D may have an important future role in the prevention and treatment of infection. In addition, there are now clear data that the active form of vitamin D, 1,25-dihydroxyvitamin D (1,25OHD) is a hormone that regulates gene expression in multiple signaling pathways apart from those impacting bone mineral density, specifically those affecting immune function and inflammation. Indeed vitamin D has immunomodulatory effects on both the innate and adaptive immune system, modulates the expression of antimicrobial peptides such as cathelicidin, and influences the inflammatory cascade. However, the optimum levels of 1,25OHD considered “sufficient” to optimize vitamin D's actions on these other signalling pathways are not yet confirmed. Given its increasingly recognized role as an immunomodulator, numerous studies have begun to explore the relationship between vitamin D deficiency and the incidence and severity of infection in adults and children. Many of these studies have focused on respiratory disease, although there is now evidence that vitamin D deficiency is associated with systemic infection (Kempker and martin, 2013). We will briefly review recent studies exploring the role of vitamin D as an immunomodulator, especially as it relates host susceptibility to infection, and identify important gaps in our understanding of these mechanistic pathways. Additionally, we will examine epidemiological studies linking relative vitamin D deficiency to risk of infection, as well as completed and ongoing clinical trials assessing the efficacy of vitamin D supplementation for prevention and treatment of infection. The growing body of evidence implicating vitamin D as a key component of immune regulation has led to further questions about its mechanisms of action and its therapeutic potential that will require further study.

Vitamin C and Infections

Vitamin C was identified in the early twentieth century in the search for a substance, the deficiency of which would cause scurvy (Hemilä, 2006). Scurvy was associated with pneumonia in the early literature, which implies that the factor that cured scurvy might also have an effect on pneumonia. Alfred Hess (1920) summarized a series of autopsy findings as follows: “pneumonia, lobular or lobar, is one of the most frequent complications (of scurvy) and

causes of death” and “secondary pneumonias, usually broncho-pneumonic in type, are of common occurrence and in many (scurvy) epidemics constitute the prevailing cause of death” He later commented that in “infantile scurvy a lack of the antiscorbutic factor (vitamin C) which leads to scurvy, at the same time predisposes to infections (particularly of the respiratory tract). Similar susceptibility to infections goes hand in hand with adult scurvy” (Hess, 1932). In the early 1900s, Casimir Funk, who coined the word “vitamin”, noted that an epidemic of pneumonia in the Sudan disappeared when antiscorbutic (vitamin C-containing) treatment was given to the numerous cases of scurvy that appeared at about the same time. The great majority of mammals synthesize vitamin C in their bodies, but primates and the guinea pig cannot. Therefore, the guinea pig is a useful animal model on which to study vitamin C deficiency. Bacteria were often found in histological sections of scorbutic guinea pigs, so much so that some early authors assumed that scurvy might be an infectious disease. However, Hess (1920) concluded that such results merely showed that the tissues of scorbutic animals frequently harbour bacteria, and “there is no doubt that the invasion of the blood-stream does occur readily in the course of scurvy, but this takes place generally after the disease has developed and must be regarded as a secondary phenomenon and therefore unessential from an etiological standpoint. Indeed one of the striking and important symptoms of scurvy is the marked susceptibility to infection”. When summarizing autopsy findings of experimental scurvy in the guinea pig, Hess also noted that “Pneumonia is met with very frequently and constitutes a common terminal infection”. Vitamin C was considered as an explanation for scurvy, which was regarded as a disease of the connective tissues, since many of the symptoms such as poor wound healing implied crucial effects on the connective tissues. Therefore, the mainstream view in medicine regarded vitamin C as a vitamin that safeguards the integrity of connective tissues (England and Seifter, 1986)

Vitamin E and infection

Vitamin E is the major lipid-soluble component in the cell antioxidant defence system and is exclusively obtained from the diet. It has numerous important roles within the body because of its antioxidant activity. Oxidation has been linked to numerous possible conditions and diseases, including cancer, ageing, arthritis and cataracts; vitamin E has been shown to be effective against these. Platelet hyperaggregation, which can lead to atherosclerosis, may also be prevented by vitamin E; additionally, it also helps to reduce the production of prostaglandins such as thromboxane, which cause platelet clumping.

Vitamin E has been found to be very effective in the prevention and reversal of various disease complications due to its function as an antioxidant, its role in anti-inflammatory processes, its inhibition of platelet aggregation and its immune-enhancing activity. Vitamin E was first used as a supplement in Canada by the physicians Shute and Shute; based on the positive results it achieved, they began using it regularly in their practices. Since then, well-designed experimental and clinical studies have progressed steadily and increased our knowledge of vitamin E. The antioxidative properties of vitamin E have been found to play a vital role in the battle against various diseases such as atherosclerosis, oxidative stress, cancer, and cataract. This focussed on the important functions of vitamin E in some diseases; in addition to these, this vitamin has been found to be effective against asthma, allergies and diabetes, among others. Discussion of the dietary sources, RDA and the interaction of vitamin E supplements with other dietary factors, has demonstrated the need for and significance of vitamin E in the human context. Thus, raising awareness of the role of dietary antioxidants in maintaining better health would benefit a number of lives. Apart from the enormous benefits reported, there has always been debate about the exact function of vitamin E and its role in various diseases. The primary hindrance in determining the roles of vitamin E in

human health is the lack of validated biomarkers for vitamin E intake and status, which would help to relate intakes to possible clinical outcomes. In conclusion, although the data surrounding vitamin E is contradictory, the current literature appears to support the view that the benefits outweigh the side-effects.

Conclusions

Currently, studies related to effect of vitamins on immune function is studied at the molecular level, and more research is ongoing about the therapeutic effects of vitamins on preventing and curing various infectious diseases. In addition, more research needs to be completed to further define the mechanisms by which vitamins may regulate immune responses to potentially prevent or reduce the severity of infection. While there is still much progress to be made, the emerging evidences continue to support vitamin supplementation as a promising intervention for infection.

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Ceva Polchem Pvt. Ltd.....	32
DSM Nutritional Products India Pvt. Ltd.....	11
Evonik India Pvt. Ltd.	23
Godrej Agrovet Limited	64

Nanda Feeds Pvt. Ltd.	54
Neospark Drugs & Chemicals Pvt. Ltd.....	53
Noveltech Feeds Pvt. Ltd.	12
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Prakash Foods & seeds Mills Pvt. Ltd.	33
The Himalaya Drug Company	17
The Waterbase Ltd.....	62
Trouw Nutrition (I) Pvt. Ltd.....	63
Virbac Animal Health (India) Pvt. Ltd	48

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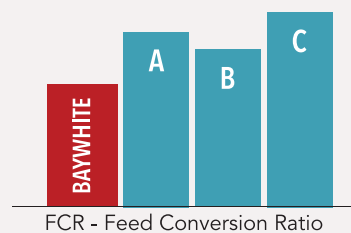
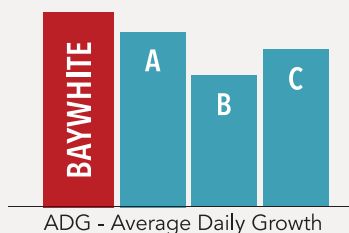


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