

Livestock & Feed Trends



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52nd Annual General Meeting (AGM)
&
61st National Symposium 2019

बोविनो

प्रीमियम कैटल फीड्स

शारिरीक विकास • दूध • सेहत • प्रजनन
के लिए सहायता करता है.



बोविनो काफ स्टार्टर

3 रे सप्ताह से 6 महीने
की उम्र तक

- निरंतर विकास
- सेहत

बोविनो काफ ग्रोअर

6 महीनों से गर्भधारणा
तक

- निरंतर विकास
- सेहत
- प्रजनन अंगों का विकास

बोविनो हीफर फीड

गर्भाधान से प्रसव तक

- निरंतर विकास
- भूषण का विकास
- थनों का विकास
- प्रसव के बाद दूध के उत्पादन में सुधार

बोविनो

दूध देने वाले गाय भैंसों
के लिए
(लैक्टेसन पीरियड)

- उच्च पोषक घनत्व वाला चारा
- खिलाने की प्रति लीटर कम कीमत
- दूध के उच्च उत्पादन, सेहत और प्रजनन में सहायता करता है



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Dear Friends,

Greetings!

It has been almost a year, since I have been communicating with you through this platform. With all your best wishes & great support, CLFMA had conducted its annual flagship event, 61st National Symposium in a grand manner on 22nd - 23rd August, 2019 at Hotel Le Meridien, Windsor Place Janpath, New Delhi. The event was focused on the Theme "Indian Livestock Farming: Prospects & Role of Government Policies" that will foster sustainable growth for Indian Livestock Sector. CLFMA Symposium enriched our visibility & recognition among the wider Industry Stakeholders and for the first time, Government of India and Industry Stakeholders interacted with each other for deliberating livestock sector related issues. In this connection, we had networking meetings with Government Representatives in the state as well as with Central Government. To make this Symposium successful, CLFMA staff had worked very proactively.

To increase the farmers income through livestock sector in real terms requires restructuring livestock processes & policy interventions. The strategies require four critical pillars—technology, institutions, infrastructure and incentive structure. Livestock based policy should be based on the principles of social acceptability, economic feasibility, technical viability and resource conservation ability. Increasing incomes by improving productivity along with stabilizing income and risk management through holistic approach are needed to double the farmers' income. Hence CLFMA thought it prudent to choose government policies as

the theme of the Symposium.

The Chief Guest of the Symposium was Shri. Giriraj Singh, Hon'ble Union Minister of Fisheries, Animal Husbandry and Dairying, Government of India. A Special Session in the morning on August 22, 2019 was held for welcoming, The Honourable Minister- Shri. Giriraj Singh, who launched the document "Nutritional Guidelines for Animal Feeds By CLFMA". This is a pioneering effort made by CLFMA, to keep the farmers, feed manufacturers and Industry abreast with latest nutrient requirements of various types of species used in animal agriculture. The renowned participants were Shri. Pawan Agarwal, CEO, Food Safety and Standards Authority of India (FSSAI), Government of India, who presented the keynote address and Shri. Atul Chaturvedi, Secretary, Department of Animal Husbandry and Dairying, Government of India, who gave the Thematic Address.

Around 400 plus representatives from Poultry, Dairy and Aqua Sectors from all parts of India and overseas attended the flagship event of CLFMA to discuss key trends and problems faced by the livestock industry.

The Symposium was attended by renowned Industry and Government Panellists. Detailed Symposium report is covered in this issue along with the selected photographs. In short, CLFMA Symposium was organized to build partnership with the government to take forward the agenda of doubling farmers' income through livestock farming. The symposium shed the light on the available government schemes related to our sector; importance of food processing in doubling farmers income and the overall industry pain points.

CLFMA for the first time has come up with a comprehensive report consisting of the details of deliberations and outcomes of the symposium, which was immediately circulated to the Ministries and Members.

On 20-21st September, 2019, I had attended the 31st Annual General Body Meeting of Poultry Federation of India at Coimbatore

CLFMA Representatives Mrs. Chandrika Venkatesh, Executive Director, CLFMA OF INDIA, Shilpa Utekar, Manager, CLFMA OF INDIA had attended the Kukut Meeting conducted by Government of Maharashtra on 24th Sept 2019 at Mantralaya, Mumbai.

The Meeting was conducted to discuss the Feed Strategy for Layer Farmers and Feed Manufacturers of Poultry. From Government of Maharashtra, Shri. Anoop Kumar, Hon'ble Secretary, AHD & F and additional in-charge Agriculture,

From the Chairman's Desk.....

Government of Maharashtra, Mumbai, Shri. Lakshminarayan Mishra, Hon'ble Commissioner, Animal Husbandry, Pune, Shri. Manik Gutte, Joint Secretary, AHD&F, Government of Maharashtra, Mumbai, Dr. Santosh Panchpor, Under Secretary, AHD&F, Government of Maharashtra, Mumbai, Dr. B. A. Shaikh, (Addl. Charge) Deputy Commissioner of Animal Husbandry, Disease Control, Pune, Dr. R. Palimkar, Asst. Commissioner of Animal Husbandry, Pune & Dr. Ajit Ranade, Associate Dean, Mumbai Veterinary College. Layer Farmers and Feed Manufacturers from Maharashtra had also attended the meeting. There was a detailed discussion on problems, which Poultry layer farmers and Feed Manufactures have been facing due to sudden increase in Maize and Soya feed cost, after which CLFMA had submitted a representation to Shri. Anoop Kumar, Hon'ble Secretary, AHD & F, Government of Maharashtra to request Central Government to continue Tariff Rate Quota (TRQ) Scheme for Maize

Post Symposium 2019 Activities:

Meeting at Krishi Bhawan, New Delhi:

On 26th September – 27th September, 2019 we had meetings with Government Officials, to enhance Government Networking and keep a personal touch with government officials and submit Symposium Report 2019 and document of Nutritional Guidelines for Animal Feeds by CLFMA

Myself along with Mr. Divya Kumar Gulati - Secretary, Mr. Suresh Deora, President – West Zone & Chandrika Venkatesh, Executive Director, CLFMA had the following meetings:

Shri. Sagar Mehra, Joint Secretary, Department of Fisheries, Ministry of Fisheries, AH&D, had a discussion about CLFMA engagements to be planned for the Aqua Sector.

Shri. G. N. Singh, Joint Secretary, (Admin / Trade/GC/PC/IC), Dept of Animal Husbandry and Dairying, Ministry of Fisheries, AH&D, for the follow-up of the approval of all the 5 Feed Additive Lists submitted by CLFMA.

Shri. Dr. O.P. Chaudhary, Joint Secretary (NLM), Dept. of National Livestock Mission, Ministry of Fisheries, AH&D, GOI., after which we had given a representation to Secretary AH&D to release Wheat and Rice 5 Lakh MT each.

Dr. Sanjeev Kumar Balyan, Hon'ble Minister of State, Ministry of Fisheries, AH& D and discussed on 1% Urea Quota and reduction of GST of 28% for Molasses used as Animal Feed to help dairy farmers and the minister conveyed that he is having discussion with ICAR regarding the same.

Shri. Keshav Chandra, JS, Dept. of Commerce, who has presently been given a new portfolio as JS, Logistics, FT (Africa), FT (WANA), EP (Textiles). Shri. Keshav Chandra discussed about contacting APEDA for having a separate cell for Animal Husbandry EPC.

We also had an introduction meeting with new JS- Shri. Diwakar Nath Mishra, Joint Secretary, Dept. of Commerce, Ministry of Commerce and Industry, GOI.

Shri Atul Chaturvedi, Secretary, Dept of AH&D, Ministry of Fisheries, AH&D, GOI. We had discussion about how to reach feed and fodder to the unorganized animal farmers, Clean milk production and growing of Subabul as fodder for cattle.

Smt. Rajni Sekhri Sibal, Secretary, Dept of Fisheries, Ministry of Fisheries, AH & D. We had a fruitful discussion for development of Fisheries Sector. The Secretary said that in fisheries the major issue is the underutilization of capacity of feed mills as the demand is not accessed properly. She also discussed in detail Fishery related issues and how to boost the Fishery Sector nationally and internationally.

Your words of appreciation and encouragement from time to time has been the source of inspiration and driving force for me to lead CLFMA OF INDIA.

Before closing, we would be grateful for your feedback or inputs anytime for our improvement.

With warm regards,

For CLFMA OF INDIA,



S. V. Bhawe

Chairman



05CHAIRMAN'S DESK

COMMODITY UPDATE.....08



29NATIONAL SYMPOSIUM REPORT

DAIRY71



77POULTRY

GENERAL81



85 PDFA - ONE OF ITS KIND OF DAIRY SHOW IN INDIA

CALENDAR OF EVENTS.....88



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Commodity Updates

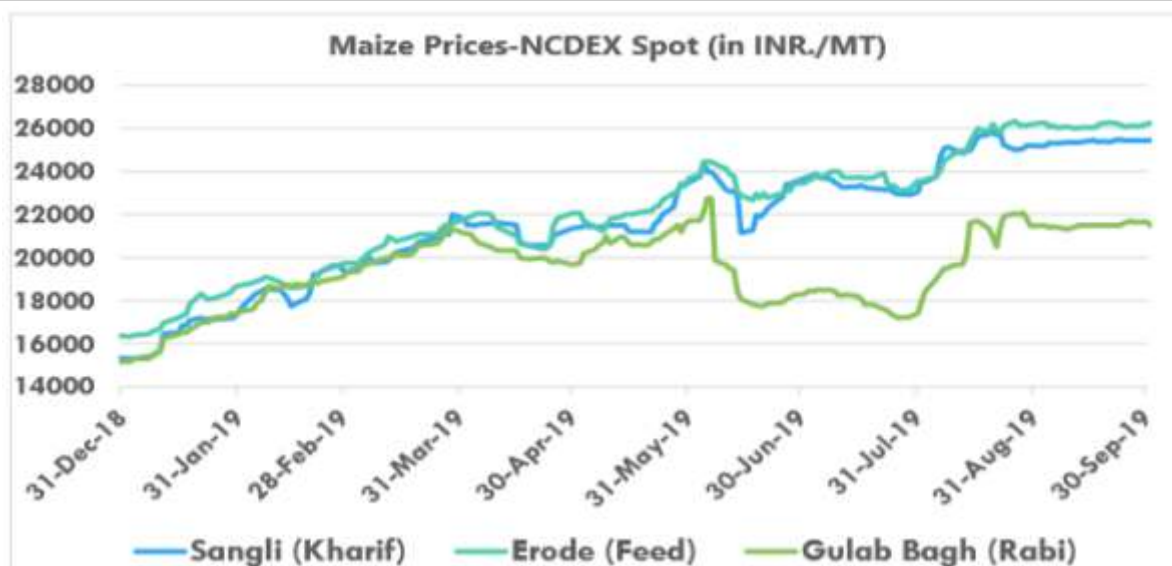


Index

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/Qtl:
Maize NCDEX Spot Price (in INR/Qtl.):

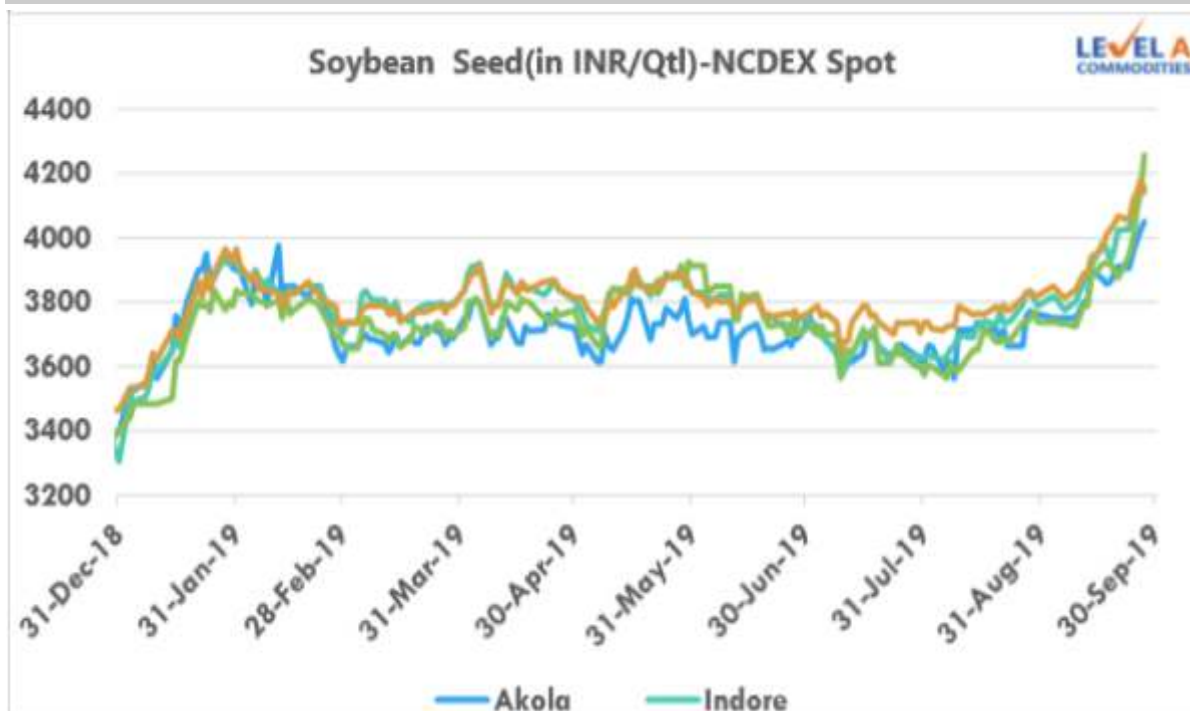
Location	30-09-2019	31-08-2019
Gulab Bagh	21380	21890
Sangli	25150	26100
Erode	25060	26210



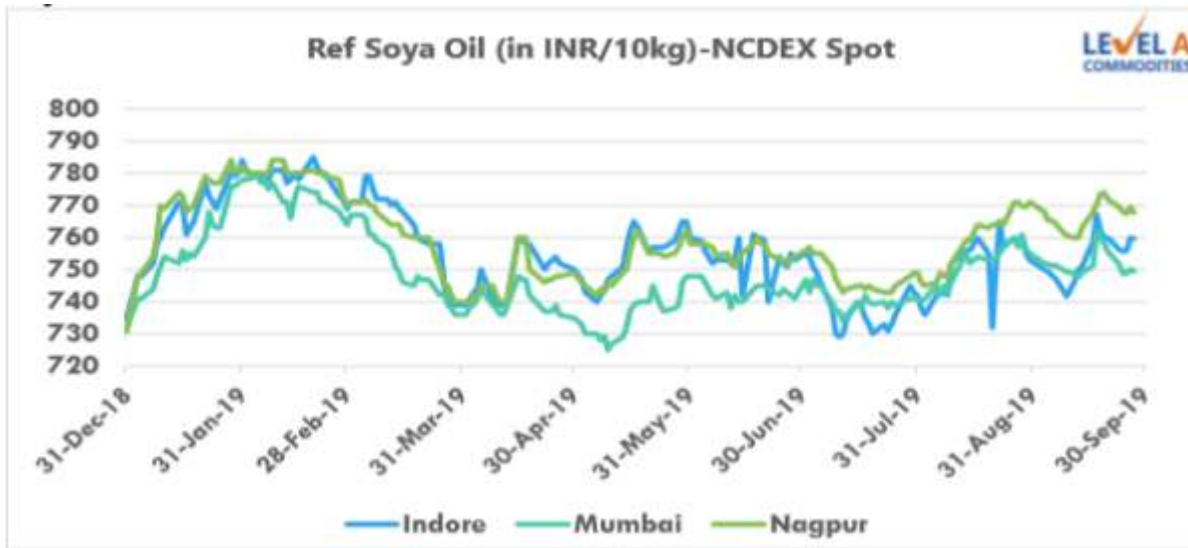
Soybean:
Soybean Complex Prices-NCDEX Spot:

Commodity (Unit)	Location	30-09-2019	31-08-2019
Degummed Soy oil (in INR/10kg)	Kandla	-	-
Ref Soya Oil (in INR/10kg)	Indore	760	753
	Mumbai	749	755
	Nagpur	768	771
Soymeal (in INR/MT)	Indore	36,656	31,500
Soybean Seed(in INR/Qtl)	Akola	4,050	3,762
	Indore	4,152	3,788
	Kota	4,257	3,737
	Nagpur	4,141	3,820

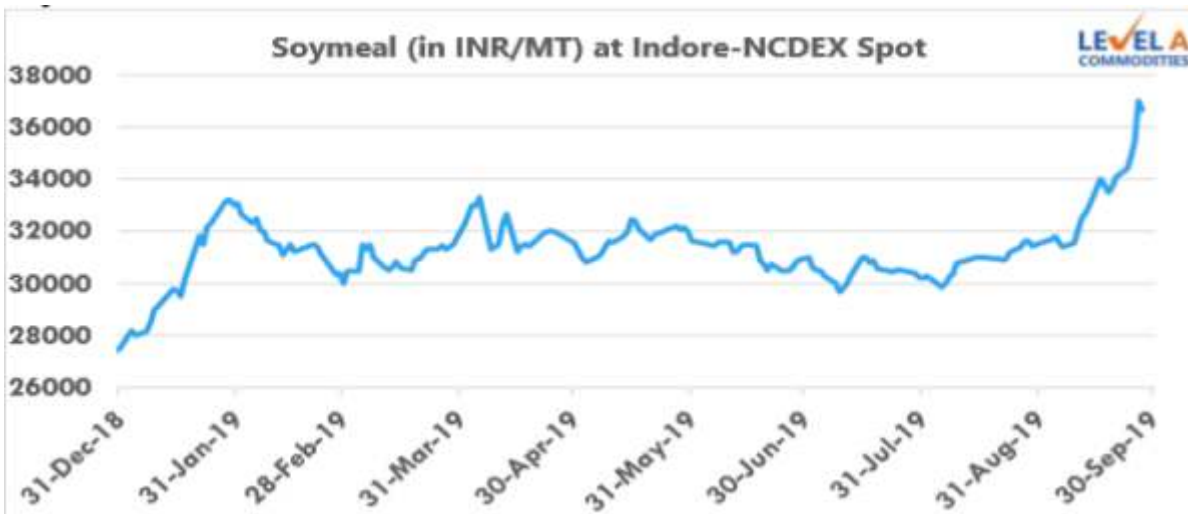
Soybean Seed



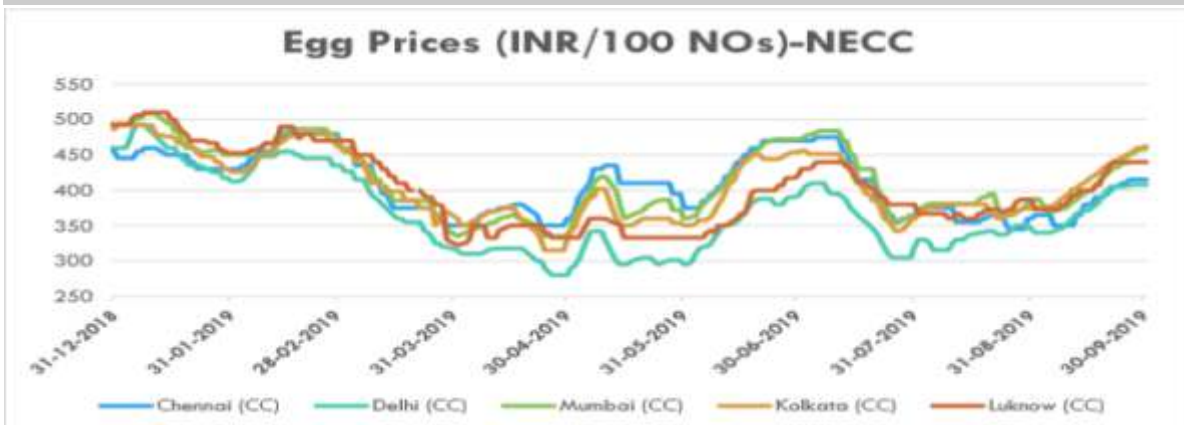
Soya Oil



Soymeal Prices-NCDEX Spot:

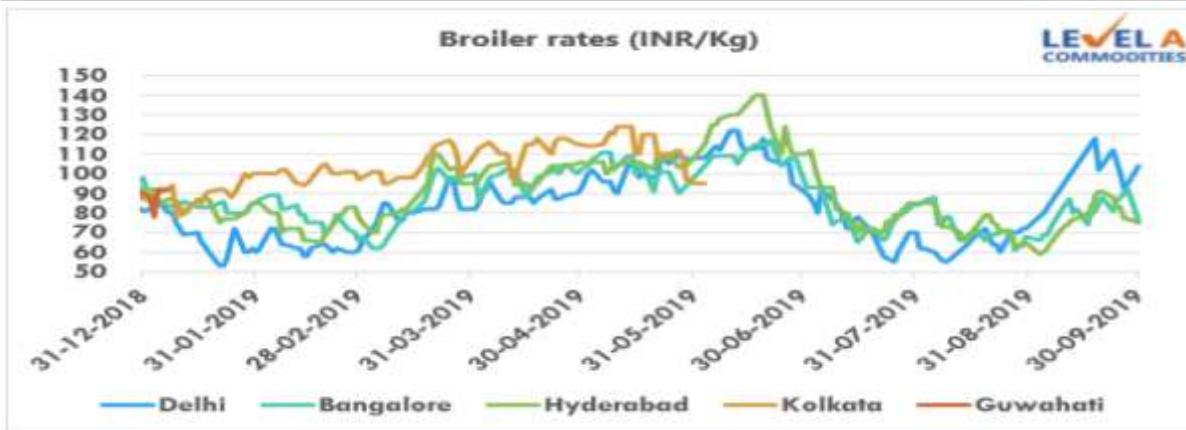


Egg Prices



Egg Rates		
NECC Prices		
Market	30-09-2019	31-08-2019
Ahmedabad	449	367
Ajmer	396	317
Banglore (CC)	419	350
Chennai (CC)	415	360
Chittoor	408	353
cochin	410	345
Delhi (CC)	408	345
E.Godavari	422	342
Hyderabad	405	333
Mumbai (CC)	458	384
Mysore	422	355
Nagpur	405	325
Namakkal	401	362
Pune	452	367
Punjab	383	326
Vijayawada	422	342
Vizag	420	361
West Godavari	422	342
Warangal	407	333
Prevailing Prices		
Market	30-09-2019	31-08-2019
Allahabad (CC)	419	357
Barwala	393	-
Bhopal	415	315
Hospet	384	315
Jabalpur	412	347
Kanpur (CC)	424	371
Kolkata (CC)	462	374
Lucknow (CC)	440	387
Raipur	412	345
Varanasi (CC)	437	383

Broiler Rates



Broiler rates (INR/Kg)

Market	30-09-2019	31-08-2019
Delhi	104	72
Punjab	91	63
Raipur	72	64
Pune	79	57
Bangalore	76	68
Hyderabad	75	65
Gujarat	80	52
Kolkata	-	-
Lucknow	79	73
Guwahati	-	-

Chicks Price (INR/Unit)

Market	30-09-2019	31-08-2019
Punjab	35	11
Chandigarh	35	11
Haryana	35	11
Himachal Pradesh	36	12
Rajasthan	36	12
Jammu & Kashmir	36	12
Uttarakhand	37	13
Uttar Pradesh	30	15
Madhya Pradesh	30	15
Chhattisgarh	30	15
Bihar	30	20
Jharkhand	30	20

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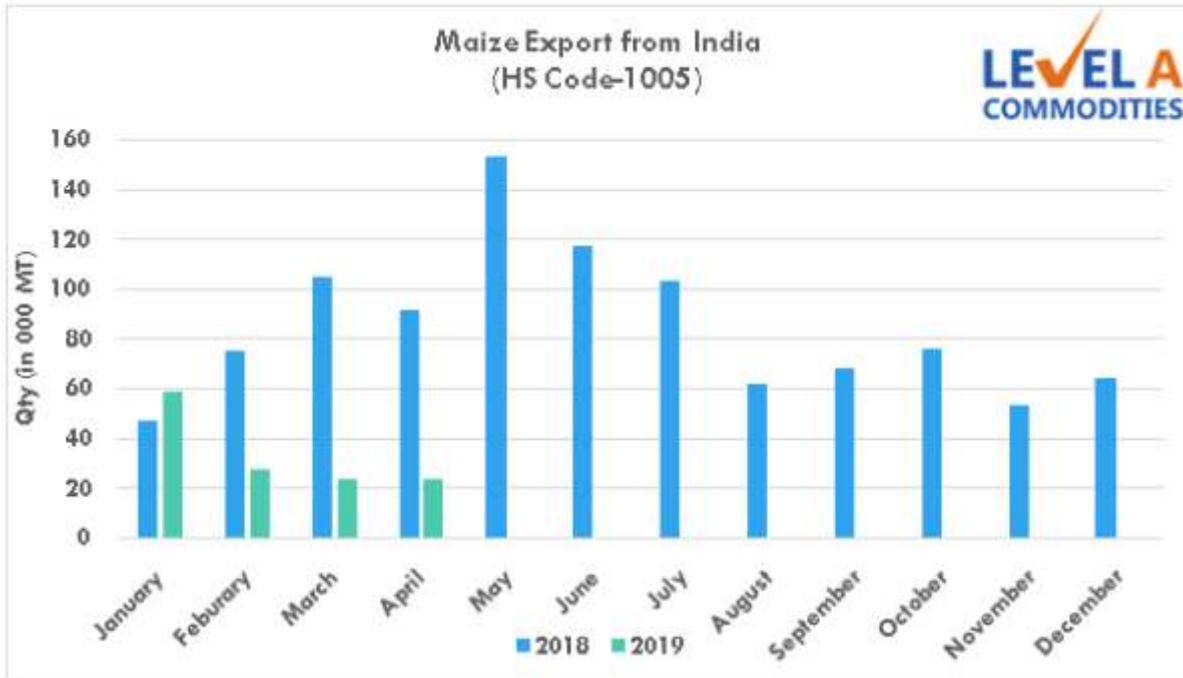
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Ambernath (East), Thane - 421501 India,
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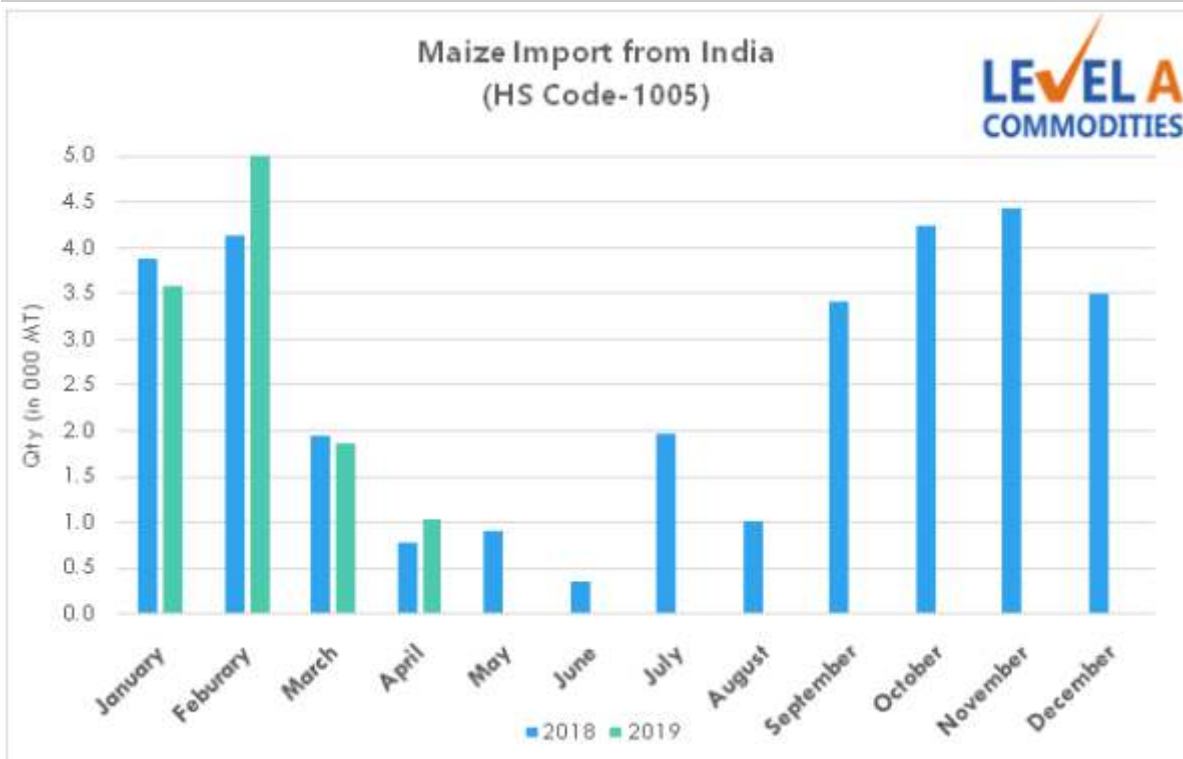
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Trade Details

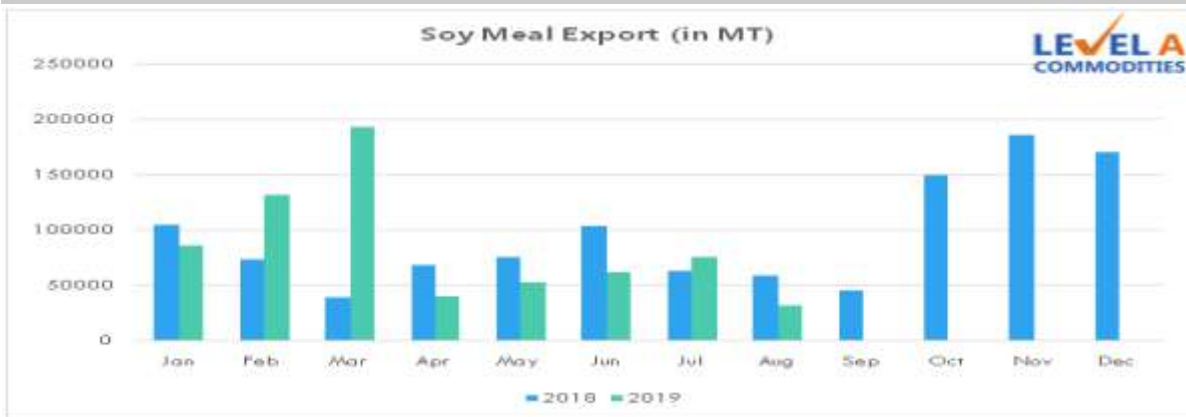
Maize export from India



Maize import from India



Soy Meal Export from India(In MT)



Market Updates

Maize Domestic

NAFED imports 50,000 tn of maize under tariff rate quota

The National Agricultural Cooperative Marketing Federation of India Ltd has imported 50,000 tn maize under the tariff rate quota to ease the declining supply in the domestic market. The consignment of 49,999 tn maize landed at Tuticorin port in Tamil Nadu last week. According to trade sources, the consignment has been delivered by Agrocorp at \$258.3 per tn, cost and freight charges. NAFED has bought the consignment under the tariff rate quota at a reduced import duty of 15% to sell it to domestic end users. Import of maize, otherwise, attracts 60% duty. The government has also allowed import of another 400,000 tn maize under the tariff rate quota after receiving representations from starch and poultry industries. It has allowed MMTC and NAFED to import 200,000 tn maize each.

Kharif maize acreage at 8 mln ha, up 2.3% on year

The area under kharif maize was 2.3% higher on year at 8.04 mln ha as of last sowing report of the rabi season. Acreage, so far, has also surpassed 7.47 mln ha, which is the normal for the season. Acreage was higher on year in Madhya Pradesh, Maharashtra, Karnataka, Punjab, Rajasthan, Chhattisgarh, and Haryana. Karnataka is the largest grower of kharif maize, followed by Madhya Pradesh.

Sowing of maize has been higher in northern states as farmers shifted from other crops, expecting better returns this year due to sharply higher spot prices, said Sehdev Jaiswal, a Pune-based trader. Currently, maize prices are at 2,360-2,400 rupees per 100 kg in Nizamabad, nearly double the year-ago level. Prices have risen sharply on year in anticipation of a decline in output in 2018-19, traders said.

However, sowing was lower on year in states like Andhra Pradesh, Telangana, Tamil Nadu and Arunachal Pradesh due to fears of fall armyworm infestation in the crop. Last year, the pest attacked the crop in these states and also Karnataka. Market participants pegged 2019-20 (Jul-Jun) kharif maize output at 16.1 mln tn. For 2018-19, they estimated the output at 15.1 mln tn, while the government pegged the output at 19 mln tn.

Cargill inaugurates first corn silo in India with investment of Rs 70 cr

Cargill recently opened its first corn silo in India in Davangere, making inroads into bulk agricultural storage in India. Built with an investment of \$10 million (Rs 70 crore) and a storage capacity of 60,000 tonne, the silo is situated next to the company's corn milling plant in the Karnataka city.

This allows Indian and global food companies access to high-quality, raw material stored at right temperature, translating to superior product quality for their food products. The silo will also provide local farmers increased market access as Cargill expands its procurement of corn locally. It was inaugurated by chief guest G M Siddheshwara, Member of Parliament, Davangere; guest of honour S Ramappa, Member of Legislative Assembly, Harihara, Karnataka, and Simon George, president, Cargill India.

Siddheshwara said, "The major population of the local Davangere community is engaged in corn farming. With this initiative, I am happy that local farmers will get more opportunities to sell their produce, making them more profitable in the long run."

Ramappa also inaugurated a local community initiative where Cargill has constructed a washroom in a school in Bhanuvalli village.

"Helping local communities is the joint responsibility of the industry as well as the government. It is very encouraging to see Cargill coming forward with public utility initiatives for the development of Davangere," he added.

"As we continue to collaborate with Indian manufacturers to expand our footprint in the starches and sweetener business, this silo is an important step towards ensuring supply of top quality corn to the plant," said George.

"We will continue to innovate for Indian and international customers and help Indian farmers align better with the market. This silo expands Cargill's supply chain capabilities in India and the stringent food safety standards followed here will prevent contamination of corn during storage. We are grateful to the Karnataka government for their support in setting up this storage solution here," he added.

Commitment to local communities

Together with TechnoServe, the non-governmental organisation (NGO) partner Cargill has been working on a local economic development programme in Davangere, that has directly impacted over 25,000 people across 27 villages.

Project Saathi is helping 5,000 small-holder farming households adopt sustainable agri-practices besides training 2,500-plus women on health, nutrition and financial literacy.

Youth in the local community participated in Cargill Agri Fellows Programme, where they were trained on skills and enterprise-based livelihood opportunities.

This programme also helped local farmers create a farmer producer company called Bhadra, with over 1,000 members to connect farmers to customers. Today they are trading in 11 input and output product categories. The project has successfully completed four years and is being continued.

Maize International

WASDE:

This month's 2019/20 U.S. corn outlook is for reduced production, lower corn used for ethanol, and slightly higher ending stocks. Corn production is forecast at 13.799 billion bushels, down 102 million from last month on a lower yield forecast. Corn supplies are down from last month, as a smaller crop more than offsets larger beginning stocks due to lower estimated exports and corn used for ethanol for 2018/19. Corn used for ethanol for 2019/20 is lowered 25 million bushels. With use falling more than supply, corn ending stocks are up 9 million bushels from last month. The season-average corn price received by producers is unchanged at \$3.60 per bushel.

This month's 2019/20 foreign coarse grain outlook is for virtually unchanged production, with fractionally lower trade and stocks relative to last month. Ukraine corn production is lowered, as dry conditions during the month of August reduce yield prospects for filling corn. EU corn production is unchanged, as reductions for France and Germany offset increases for Bulgaria and Romania. Barley production is raised for Russia, Ukraine, the EU, and Kazakhstan, but lowered for Australia and Canada.

Major global coarse grain trade changes for 2019/20 include barley export increases for Ukraine, Kazakhstan, and Russia, with a partly offsetting reduction for Australia. For 2018/19, corn exports for Brazil are raised for the local marketing year beginning March 2019, based on record large shipments during the month of August. Foreign corn ending stocks for 2019/20 are lower relative to last month, mostly reflecting declines for Brazil, Ukraine, Mexico, Paraguay, and Chile.

Canada Outlook:

For 2018-19, corn imports are expected to increase by more than 50% from the level in 2017-18 as the Prairie provinces have significantly increased corn imports due to the shortage of feed grains in 2018-19. Exports are expected to increase only slightly as STC's data shows a sharp slowdown in exports in July, although exports were much higher in the previous months before July. Total domestic use is expected to increase due to higher feed and industrial use. Carry-out stocks is estimated to decrease. The average price of corn in Chatham elevators for 2018-19 increased by 12% to \$194/t, supported by higher US corn prices and the weak Canadian dollar.

For 2019-20, Canadian corn supply is forecast to decrease from 2018-19 largely due to sharply declined imports, as well as lower carry-in stocks. Corn production is estimated by STC to increase by 2% to 14.1 Mt due to increased harvested area more than offsetting lower yields. Combined corn production in the largest two corn producing provinces, Ontario and Quebec, increased slightly to 12.5 Mt as higher production in Ontario more-than offset lower production in Quebec. In Manitoba, the third biggest corn producing province, corn production increased by 22% to 1.5 Mt. Imports are expected to decrease significantly as the Prairie provinces are not anticipated to import the same large amount of corn from the US as in 2018-19.

Corn domestic use for 2019-20 is expected to decrease from 2018-19 largely owing to lower feed use. Exports are anticipated to decrease on lower deliveries to the EU. Carry-out stocks are forecast to decline on smaller supply.



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The average price of corn in Chatham elevators for 2019-20 to date increased by \$30/t from a year ago to \$216/t. But for the crop year, the average corn price is anticipated to remain the same as last year.

US corn production for 2019-20 is projected to decrease by 4.3% from 2018-19 due to a decline in yields, according to the USDA. The average farmgate price of corn in the US is projected at US\$3.60/bu, unchanged from 2018-19. Corn production in other major world exporters remains abundant in Argentina and Brazil and is expected to increase in Russia and Ukraine, which should weigh on corn prices.

Ukraine's high corn yields to pressure U.S. export business

Ukraine, the largest corn exporter in the eastern world, has started to harvest its new crop. While it's early in the season, the yield reports are coming in on the high side.

With more corn being pushed into the global export pipe, the U.S. farmers may see increased competition in that arena in 2019 and 2020.

Ukraine's starting corn average yield is 95 bushels an acre (6 mt/ha), 8% above last year. Ukraine has harvested 3% of its corn acreage as of Sunday. So, yield figures will change, but there are good chances that the country's crop is likely to be record-high.

The Ukraine-based The Sizov Report estimates the new crop at 1.4 billion bushels (36.3 million metric tons (mmt), compared with the latest USDA estimate of 36 mmt, and 1% above the 2018 record.

Until late August, when dryness somewhat damaged the yield potential of late-planted corn, the weather conditions were generally favorable for the new crop.

The good Ukrainian corn crop could put pressure on other corn producers, including the U.S. farmers. With low domestic consumption and no ethanol industry to absorb the excessive supply, big crops in Ukraine convert into big exports.

Typically Ukraine ships abroad 70% to 80% of its corn crop. This season the country is expected to export 1.16 billion bushels (29.5 mmt vs. USDA's estimate of 30 mmt) of corn, which is close to the previous season's record.

At the same time EU, the largest market for Ukraine, is expected to significantly cut corn imports this year, by 13% to 0.8 bln bu (21 MMT), due to the good wheat crop, part of which will go to feeding. For Ukraine, this may be partly offset by larger Chinese imports forecasted by USDA to rise from 182 million bushels (5 MMT) to 255 million bushels (7 MMT) on a lower domestic supply.

China is another top destination for Ukraine.

However, even with bigger Chinese shipments, Ukraine still could have an extra exportable surplus that needs to find a market. Those markets are likely to be found also in Asia, including such important buyers of U.S. corn like South Korea (USDA: 0.4 bln bu; 10.5 MMT annual imports) and Japan, the largest world corn importer, which is expected to buy 0.6 bln bu (15.6 MMT) this season.

Japan is the second-largest buyer of U.S. corn and South Korea is the fourth largest. Ukraine used to supply corn to those countries in the past, but in limited volumes. This season, it could try to enter those markets again.

Despite the projected decrease in corn exports from South America, U.S. corn farmers could see Ukraine sell its ample supply into Asia.

Soy meal Domestic

Soybean output set to rise to 14 mt

India's soyabean output is seen rising this year, on increase in acreage and copious rains in the key growing regions of Madhya Pradesh and Rajasthan, according to a government entity.

"Soyabean production will be higher this year and we expect it to be at least around 14 million tonnes," said VS Bhatia, Director, ICAR-Indian Institute of Soyabean Research, based in Indore. In 2018-19, soyabean output stood at 13.78 million tonnes, according to the fourth advance estimates of the Agriculture Ministry.

With prices remaining favourable for most part of the marketing season last year, farmers have planted more area under the oilseed this kharif. Soyabean acreage is two per cent higher than normal this year at 113 lakh hectares and about one per cent higher than last year. Farmers in MP and Rajasthan have planted more area while the area has shrunk in Maharashtra.

Excess rainfall

However, with most parts of Central India receiving excess rains, there have been concerns about water-logging in several areas hurting the crop. Madhya Pradesh, so far, has received 19 per cent excess rains in the ongoing monsoon season, while the surplus rainfall in Rajasthan stood at 33 per cent.

Bhatia said the crop is in good condition, mainly in Malwa region, the main growing area, where the rains have been good. "There have been some isolated cases of water-logging and also some instances of pest attacks and diseases. We have already issued an advisory to farmers to deal with the pests and diseases," Bhatia said.

Harvest schedule

The harvesting of the early maturing varieties will begin by September 20-25 and full-scale harvesting will be from October 15.

DN Pathak, Executive Director, Soyabean Processors Association of India (SOPA) said it was still raining in parts of Central India and premature to comment on the crop size at this point. SOPA will conduct a crop survey from September 26 till October 4. Last week, SOPA maintained that there was no widespread or excessive damage to the crop from excess rains.

Govindbhai Patel of GG Patel and Nikhil Research Company, while maintaining that the crop condition of soyabean was good, expects the crop size to be marginally lower at around 10 mt, down from last year's estimates of 10.2 mt. "Though the area is higher by 1 lakh ha this year, delayed sowing is set to impact the yields," Patel said.

Last week, Skymet in its kharif crop projections had also projected a lower output of 11.99 mt due to lower yields on delayed planting. However, NCML had projected a marginal increase in output at 13.84 mt.

Malaysian and Indian Industry Join Hands to Promote Sustainable Palm Oil Production and Trade

A Memorandum of Understanding (MoU) is signed between The Solvent Extractors' Association (SEA) of India, the Malaysian Palm Oil Board (MPOB) and Global Sustainability support organisation-Solidaridad Network Asia Limited (SNAL) during the Globoil Annual Conference held on 26th September, 2019 at Mumbai. The MoU is signed by Atul Chaturvedi, President, SEA, Dr Ahmad Parveez Hj Ghulam Kadir, Director General, MPOB and Dr Shatadru Chattopadhyay, Managing Director, SNAL in the presence of Madam Teresa Kok, Minister of Primary Industries NSE -0.56 %, Government of Malaysia.

"The objective of this MoU is to jointly promote Malaysian Sustainable Palm Oil (MSPO) and Indian Palm Oil Sustainability Framework (IPOS) through harmonization between the two national standards. It would lead to the joint promotion of IPOS aligned MSPO certified palm oil to Indian markets and support smallholder palm oil producers in Malaysia to produce sustainably. There are plans to start promotional campaigns in India to close the gap between the issues of perception, allegations and the realities of palm oil," a release from SEA said.

It added further: "Solidaridad's role would be to convene the dialogue process between India and Malaysia and scale up its support to the smallholder palm oil farmers in Malaysia. Solidaridad has been partnering with MPOB to support more than 70,000 palm oil smallholders to produce better and prepare them for MSPO certification. It has developed digital support tools which will offer new perspectives for continual improvement at farm level, and smart use of big data will boost innovation in markets."

Atul Chaturvedi, President of the Solvent Extractors' Association of India (SEA), said "Time has come to prepare countries for having their own national standard, rather looking elsewhere, like Malaysia is having Malaysian Sustainable Palm Oil (MSPO), Indonesia is having Indonesian Sustainable Palm Oil (ISPO) and India too have Indian Palm Oil Sustainability (IPOS). I am confident that synergies between IPOS and MSPO would jointly safeguard the competitiveness of the palm oil industry, readiness for facing future consumer demands in sustainable manner and fulfil the national commitments towards sustainable production and trade of palm oil. This would lead the way for long term sustainability of palm oil sector in the region by reducing barriers and facilitating enhanced production and trade of sustainable palm oil"

Dr Ahmad Parveez Hj Ghulam Kadir, Director General, Malaysian Palm Oil Board (MPOB), said "Through this tripartite MoU between MPOB, SEA and SNAL, the Parties agreed to broadly promote MSPO and IPOS through harmonization between the two national standards to ensure ease of passage of Malaysian Palm Oil into India".

Dr Shatadru Chattopadhyay, Managing Director of Solidaridad Asia, said: "National initiatives like MSPO and IPOS led by the Government and local stakeholders are the critical tools for broad-based inclusive sector transformation in the palm oil. Asian stakeholders have decided to define for themselves what is sustainable for their producers and consumers. It is a movement that Solidaridad appreciates and seeks to support for making sustainability a local agenda from being perceived as a "western agenda".

It is expected that the cooperation between SEA – MPOB – Solidaridad, will accelerate the process towards the continued growth of the palm oil industry and thereby transforming sustainable palm oil sector. Overall, this collaboration will be a long-lasting one and a win-win for both Malaysia and India.

To cut imports, Centre plans to boost oilseed cultivation

After achieving self sufficiency by incentivising production of pulses, the Centre is keen on giving a push to oilseeds cultivation, a move that could help reduce the country's dependence on edible oil imports.

"The government is fully interested in promoting oilseeds now and various options are being explored," Parshottam Rupala, Union Minister of State for Agriculture and Farmers Welfare, told BusinessLine on the sidelines of the World Seed Congress 2019.

Rupala said the government wants to cut down on the huge edible oil import bill, which exceeds ₹60,000 crore per year. Besides focussing on improving the productivity, output and expanding the cultivation in the irrigated areas, the government also proposes to incentivise farmers to take up oilseeds, Rupala said.

The success achieved in pulses production by incentivising the farmers could be replicated in the area of oilseeds, Rupala said.

Pulses output saw a major increase after the Centre increased the minimum support price (MSP) and strengthened the procurement mechanism. Pulses production rose from 16.3 million tonnes in 2015-16 to 25.42 million tonnes in 2017-18, an increase of 55 per cent over three years. As per the fourth advance estimates, pulses production during 2018-19 stood at 23.40 million tonnes. India's pulses consumption is estimated at around 24 million tonnes.

India's edible oil consumption is estimated at around 22 million tonnes a year. Over two-thirds of the edible oil requirement is met through imports, entailing a huge foreign exchange outgo. The domestic production of edible oils is estimated to be between 6-7 million tonnes. Oilseeds production has gone up from 25.1 million tonnes during 2003-04 to around 32.26 million tonnes during 2018-19.

However, the production has been stagnant over the past three years, hovering around 31-32 million tonnes.

Soy meal International**WASDE:**

U.S. oilseed production for 2019/20 is projected at 110.2 million tons, down 1.3 million from last month with lower soybean and cottonseed production partly offset by a higher peanut forecast. Soybean production is projected at 3.6 billion bushels, down 47 million on a lower yield forecast of 47.9 bushels per acre. Soybean supplies are reduced 2 percent on lower production and beginning stocks. With soybean crush and exports unchanged, ending stocks are projected at 640 million bushels, down 115 million from last month.

The U.S. season-average soybean price for 2019/20 is forecast at \$8.50 per bushel, up 10 cents. The soybean meal price is projected at \$305 per short ton, up \$5.00. The soybean oil price forecast is unchanged at 29.5 cents per pound.

Changes for 2018/19 include higher U.S. soybean exports, higher crush, and lower ending stocks. Exports are increased 45 million bushels based on official trade data through July and indications from August export inspections, which were record high for the month. With crush raised 20 million bushels, ending stocks for 2018/19 are projected at 1.0 billion bushels, down 65 million.

This month's 2019/20 global oilseed outlook includes lower production, increased trade, and reduced stocks relative to last month. Global rapeseed production is at a 3-year low, mainly reflecting lower production for the EU on both area and yield. Australia's production is also lowered this month due to dry weather conditions in New South Wales and Queensland. Soybean production is down slightly this month as lower U.S. production is mostly offset by higher output for India, Canada, and China.

Major global oilseed export changes for 2019/20 include higher rapeseed and soybean exports for Canada. For 2018/19, soybean exports for Brazil are lowered based on lower than-expected shipments during the past few months. However, higher-than-expected exports by Argentina and the United States, particularly to China, are offsetting. Global soybean ending stocks for 2019/20 are lower as reduced stocks for Argentina and the United States are partly offset by higher stocks for Brazil, Iran, and India.

Canada Outlook:

For 2018-19, exports are estimated at 5.2 , versus the 4.9 Mt shipped in 2017 -18. Soybean crush is expected to increase marginally from last year to 2.0 Mt. Carry -out stocks are estimated at 0.67 Mt, up slightly from last year. Soybean prices declined to \$406/t versus \$434/t for 2017-18.

For 2019-20, production is estimated at 6.49 Mt, down from the 7.27 Mt grown in 2018 -19 and the record 7.72 Mt grown in 2017 -18 mostly due to the 10% decline in planted area and slightly lower yields. By province, Ontario is the largest grower of soybeans, at an estimated 60% of total production, followed by Manitoba at 21%, Quebec at 16% and Saskatchewan accounting for 2% of Canadian output.

Total supply is forecast to decrease by 16% to 7.6 Mt, which is expected to pressure exports by 10%, to 4.7 Mt. Exports are destined for a diverse group of countries. Domestic processing is forecast to decrease slightly to 1.9 Mt on stable domestic soyoil consumption and a shortfall in domestic soymeal supplies filled by imports of US product. Carry -out stocks of soybeans are forecast to tighten to 0.45 Mt. Soybean prices are forecast to fall to \$380 -420/t while a stable Canadian/United States currency exchange rate is forecast.

For 2019-20, the USDA reduced its oilseed production outlook by 1.3 Mt from August, to 110.2 Mt as lower cottonseed and soybean production was partly offset by higher output of peanuts. The soybean production estimate was reduced by 47 million bushels to 3.6 billion bushels which is sharply lower than the 4.5 billion bushels grown in 2018 -19. US ending stocks are estimated at 640 million bushels, down from the August estimate of 755 million bushels and sharply lower than the 1.0 billion bushels expected to be carried out for 2018 -19. US soybean prices are projected at an average of US\$8.50/bu for 2019-20 and 2018-19 compared to US\$9.33/bu for 2017-18.

Factors to watch are:

- the fall harvest weather
- the Canada and US harvest pace and yields
- the buying pace from importing countries
- the export sales pace in the US and Canada

IGC leaves grain forecast unchanged, cuts corn, soybean output

The International Grain Council (IGC) left its overall grain production forecast unchanged at 2.15 billion mt on Thursday, with a 3 mt increase in barley output in Russia and Syria offset by a drop for corn, sorghum, wheat, and oat production.

On a yearly basis, the overall grain output is poised to grow moderately by 1%, although it will still be the second-largest crop in history, with overall projections just a touch lower than the USDA's Wasde forecast of 2.16 billion mt.

Global wheat production for the 2019/20 marketing year was unchanged from last month's estimate at 764 million mt, with carryover stocks rising just 1 million mt to 272 million mt.

Wheat consumption forecasts were decreased by 1 million mt to 757 million mt.

IGC cut corn production 1 million mt to 1 billion mt, which is below the September Wasde forecast of 1.1 billion mt.

Global crop output is expected to decrease 30 million mt year-on-year, with carryover stocks dropping 40%.

That contrasts with Wasde forecasts that put world soybean output at 341 million mt in the 2019/20 marketing year.

The 6% year-on-year fall in soybean production comes following a plunge in US production as well as uncertainty over acreage prospects in Argentina.

Market Drivers**Maize**

Market Drivers	Monthly Outlook
Overall maize cash markets	Bullish
India imported around 13,752 MT of maize for the month of July'19	Bullish
Maize sowing in comparison to corresponding period last year	Bullish
USDA:Septembercorn production reduced	Bearish

Soymeal

Market Drivers	Monthly Outlook
Overall maize cash markets	Bullish
India imported around 13,752 MT of maize for the month of July'19	Bullish
Maize sowing in comparison to corresponding period last year	Bullish
USDA:Septembercorn production reduced	Bearish

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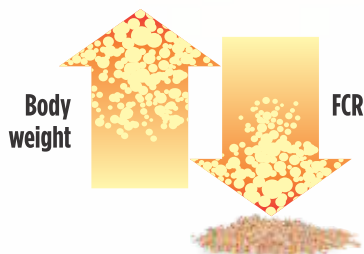
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61st National Symposium 2019

"Indian Livestock Farming: Prospects & Role of Government Policies"

Date: August 22, 2019 & Aug 23, 2019

Venue: Le Meridien, New Delhi

CLFMA OF INDIA conducted the two-day symposium and has brought about the report consisting of the details of deliberations and outcomes of the symposium

Presented by:

S. V. Bhave, Chairman, CLFMA OF INDIA

Inaugural Session

CLFMA of India, the apex organization and the voice of the country's dynamic livestock sector conducted its annual flagship event, 61st National Symposium in a grand manner on 22nd - 23rd August, 2019 at Hotel Le Meridien, Windsor Place Janpath, New Delhi. The event focused on the Theme "Indian Livestock Farming: Prospects & Role of Government Policies" that will foster sustainable growth for Indian Livestock Sector.

The Chief Guest of the Symposium was Shri Giriraj Singh, Hon'ble Union Minister of Fisheries, Animal Husbandry and Dairying, Government of India. Shri. Pawan Agarwal, CEO, Food Safety and Standards Authority of India (FSSAI), Government of India, presented the keynote address and Shri. Atul Chaturvedi, Secretary, Department of Animal Husbandry and Dairying, Government of India gave the Thematic Address.

The Symposium started with a Special Session in the morning on Aug 22, 2019 for welcoming Shri Giriraj Singh, Hon'ble Union Minister of Fisheries, Animal Husbandry and Dairying, Government of India. The Honourable Minister launched the book "Nutritional Guidelines for Animal Feeds By CLFMA". This is a pioneering effort made by CLFMA to keep the farmers, feed manufacturers and Industry abreast with latest nutrient requirements of various types of species used in animal agriculture.

The Inaugural Session started with the welcome address by Mr. Divya Kumar Gulati, Secretary CLFMA OF INDIA. Mr. Gulati mentioned that the livestock sector is becoming a sunrise sector and all the stake holders including the

government have to work in close co-ordination and emphasised the fact that doubling farmers' income can be achieved by focussing more on livestock farming. He said that the Symposium is being organized to build partnership with the government to take forward the agenda of doubling farmers' income through livestock farming.

This was followed by the lamp lighting ceremony.

Addressing the occasion Mr. S. V. Bhave, Chairman, CLFMA OF INDIA said that the Government has recognized the unexposed potential of Livestock Sector and created a separate/dedicated Ministry for Fisheries, Animal Husbandry and Dairying and since livestock sector has its own parent ministry now it will be an easy process for all the stakeholders to resolve the issues/problems. He thanked the government for taking this transformative step.

Shri Giriraj Singh in his speech appreciated CLFMA OF INDIA for conducting the event and said that the ministry is involved in making a model for the livestock sector, which will work on co-existence of all the species including the humans involved in the food chain, promote Scientific Technologies and Integrated Farming Systems. He emphasized that QPM maize, moringa, Bajra and Cassia should be promoted as animal feed as the protein percentages is more in these feeds and can be produced by Indian farmers. He is planning to start livelihood incubation centres for livestock and also promoting few practices that will benefit the farmers viz merino sheep which will be useful for dual purpose (meat and wool) and promotion of Goat Farming.

Delivering the Thematic Address at the Symposium Shri. Atul

Chaturvedi, Secretary, Department of Animal Husbandry and Dairying, Government of India said that, apart from the Doubling Farmers' Income the Hon'ble Prime Minister of India had the vision of 5 trillion-dollar economy and the sectoral allocations were 3 trillion to service sector, 1 trillion to manufacturing and one trillion to agriculture. Presently, Agriculture contributes to 270 to 280 billion and to take it to 1 trillion mark in near future, we need to focus on Animal Husbandry, Dairying & Fisheries. He said that breeding techniques, compound livestock feed or nutrition of fortified foods, control of diseases especially FMD and Brucellosis play an important role to increase productivity of animals. He also emphasized promoting processing, marketing and exports of value-added products.

Shri Pawan Agarwal, CEO, Food Safety and Standards Authority of India (FSSAI), Government of India delivered the Keynote Address. He emphasised the importance of Food Safety in the country and said that FSSAI will be stringent

about food safety concerns so that safe food is available in our country. He also said that, FSSAI will be working with Ministries and Agencies, who are responsible for primary production and safety regulations will be started at this level itself, as it is difficult to remove the contamination occurring in the primary producing stages while processing.

This was followed by the CLFMA Award Ceremony. The Life Time Achievement award was presented to Mr. P. S. Nandakumar, MD, Nanda Feeds Pvt. Ltd. CLFMA Awards were presented to Dr. Ashish Motiram Paturkar, Hon'ble Vice-Chancellor, Maharashtra Animal & Fishery Sciences University, Nagpur, Dr. Ashok Kumar, ADG- ICAR and Dr. Raghavendra Bhatta, Director, ICAR-National Institute of Animal Nutrition and Physiology, Bengaluru for their marvellous contribution to the Indian Livestock Sector.

The vote of thanks was proposed by Mr. Neeraj Kumar Srivastava, Dy. Chairman, CLFMA OF INDIA.



Day 2 Symposium Proceedings

The Second day Symposium started with the Welcome Address by Mr. Naveen Pasupathy, Treasurer, CLFMA OF INDIA.

Session-1

The First session was titled “**Doubling Farmers' Income: Government and Industry Partnership**”. **Mr. Balram Singh Yadav**, Managing Director of Godrej Agrovet Ltd. was the moderator of the 1st Session. The **1st Session's Panellists** from the **Government of India**, were

Shri. Tarun Shridhar, IAS(Retd.) Former Secretary, Department of Animal Husbandry and Dairying (AH&D), **Shri. Sagar Mehra**, Joint Secretary, Department of Fisheries, Ministry of Fisheries Animal Husbandry & Dairying. The Panellists from the Industry side were, **Mr. Daljit Singh**, Chairman, Progressive Dairy Farmer's Association (PDFA), represented the Dairy Industry, **Mr. Ravi Kumar Yellanki**, Managing Director, Vaishaki Bio Resources & Vaishaki Bio Marine, represented the Fishery Industry and **Mr. B. Soundararajan**, Managing Director of Suguna Holdings Pvt. Ltd. and immediate past chairman of CLFMA, represented the Poultry Industry. In the 1st Session, the problems faced by the Fisheries, Dairy and Poultry Industry, existing Government Schemes were discussed in detail and recommendations were drawn. The Summary of the discussions are given below: -

A) Background & Industry Brief

Doubling farmers income is achievable by focusing more on Livestock Farming, as this sector is not much affected by the vagaries of Monsoon, has better price stability as compared to food grains, it is not seasonal and can be carried out throughout the year and is a stable source of income and employment.

Sector wise contribution to GDP:

- Agriculture Industry contributes to 17% of GDP (valued @ 505 Billion USD)
- Of which Animal Husbandry sector contributes to 27% (valued @ 136 Billion USD)
- In developed countries Animal Husbandry contribution in Agriculture Industry is about 40%.
- Livestock sector is growing at a faster pace

compared to crop farming. Rate at which Animal Agriculture GDP grew b/w 2011-12 to 2016-17 (livestock + fisheries) is 6.63% as compared to Crop Agriculture GDP Growth which is 1.01%

- Need to promote the growth of Animal Husbandry to become at par with the contribution levels of Developed Countries.

Poultry Sector:

- In India, Poultry Sector plays a very crucial role, as it contributes to INR. 1,20,000 Crs.
- Poultry sector is growing @ rate of around 7% - 8% over the last decade.
- Poultry sector is expected to grow @ rate of 8% - 10% in the coming years on account of increasing urbanization, expanding job markets and rising middle class.
- Poultry sector produces 5.8 Million MTs of poultry meat leading to per capita consumption of 4.32 kgs. (World average – 16 kgs)
- Poultry sector produces 100 billion eggs per year leading to per capita consumption of 74 eggs. (World average – 210 eggs)
- National Institute of Nutrition (India) recommends per capita consumption of 10.8 kgs of poultry meat and 180 eggs.
- As compared to world average and National Institute of Nutrition recommendations, we need to go a long way in supply of poultry meat and eggs.

Impact of Poultry Sector on Society: 3 Major Benefits

1. Support to Nutritional Security
2. Enrichment of Farmers Livelihood
3. Employment Generation

1. Support to Nutritional Security

- Poultry sector is helping in addressing nutritional security of our country in a big way by supply of nutrition rich poultry meat and eggs.
- According to FAO, around 20 Crore people in India are under-nourished (15% of the Indian population).
- 20.8% of children under the age of 5 are under weight

- 37.9% of children under the age of 5 are stunted
- 51.4% women in the reproductive age (15-49 years) are anaemic
- The Global Hunger Index 2018 ranks India at 103 out of 119 countries based on above indicators
- Hence it is very critical to promote Poultry Sector to address to nutritional requirement

2. Enrichment of Farmers livelihood

- Indian Government has set a target of doubling farmer's income by 2022 and constituted DFI committee to monitor and support in achieving the target.
- One of the main sources of income as identified by DFI committee is livestock segment.
- Poultry being the main constituent of livestock segment plays a vital role in enriching the livelihood of farmers by providing them sustainable income throughout the year.
- More than 5 lac farmers are associated in broiler farming (meat production) and layer farming (egg production).
- With the less amount of capital and land availability, the farmers are able to take care of their income/earnings, financial independence & stability.
- Farmers associated with Poultry production are able to support the well-being of all their dependents with their sustainable income levels.

3. Employment Generation:

- Poultry sector helps in supporting employment generation in a big way especially supports generation of rural employment.
- More than 4 million people are employed directly and indirectly in the Poultry Sector and the value of employment generation is to the tune of 1.3 Crs (approximately).
- Expected to increase the employment opportunity by 15% per annum in coming years.

B) Problems faced by Poultry Industry

1. Cost of production has gone up by 30%
2. Lack of feed supply from the domestic market, corn and

soya is being imported by paying regular duty from Ukraine and Burma.

3. Status of Corn supply:

- 3.1. Currently, there is acute shortage of corn in India, where demand exceeds supply.
- 3.2. During the last 3 years, Indian corn production remains stagnant at around 29 Million MT
- 3.3. As a result of it, Indian corn prices has gone up/high to 350 USD/MT (Rs.25/kg)
- 3.4. Whereas, corn is available in the International market at about 205-215 USD/MT
- 3.5. The restriction on importation of corn also restricts growth of Poultry Sector.
- 3.6. Army worm issues expected to impact corn production and reduce corn supply in the market.
- 3.7. If this situation continues, then the Poultry sector in country might face serious shortage of corn.
- 3.8. The high corn prices have already led to higher production cost of poultry products.
- 3.9. High production cost of poultry products deprives us of level playing ground with international Poultry Sector.

4. Status of Soya meal supply:

- 4.1. Currently India does not face shortage of supply.
- 4.2. However, the reducing soya plantation acreage and monsoon fluctuations are expected to impact the soya production and supply.
- 4.3. Also post GST, the soya seed and soya meal levied @ 5% GST has led to increase in prices.
- 4.4. The tax burden of 5% GST leads to high soya meal input cost and increases the final product prices. The feed cost is increasing because of the tax levied on soya seed and soya meal.
- 4.5. Poultry sector also cannot take input tax credit (ITC) as the poultry products are non- taxable except for the processed poultry products.

5. Government's ban on Cage Rearing

6. Problems in Poultry Exports:

- 6.1. Countries such as Brazil and US, despite high transportation costs, exports poultry meat at a very competitive price around the world as compared to India. India, due to high raw material

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price & production cost is not competitive in the Global market. Farmers are deprived of level playing ground as far as raw material prices are concerned.

C) Recommendations for Poultry Sector

As Poultry sector plays a very critical role in contributing to the economy and benefitting society in a bigger way, the Government is requested to support for the stability and growth of the Poultry sector in the following ways:

1. Support in Raw Materials:

- 1.1. Corn and soya are the main constituents of the poultry diet (contributes to 75% of the RM cost)
- 1.2. To provide the poultry products at an affordable price and thereby increase poultry meat and egg consumption there should be availability of Corn and Soya meal at reasonable prices

2. Government initiative to address corn shortage:

- 2.1. Currently non- GMO corn import is allowed from Ukraine (but high landing price 350 USD)
- 2.2. As short- term initiative, Government is requested to allow corn imports from other non - GMO corn producing countries like Myanmar.
- 2.3. As a long - term initiative, government is requested to allow corn imports from GMO corn producing countries like US and south American countries.
- 2.4. Government is requested to allow duty free corn import (to be exempted from import duty).
- 2.5. Government can also allow sale of wheat (which is an alternate raw material for corn) at MSP from the warehouse.

3. Government initiative to address soya meal:

- 3.1. Government is requested to waive off the GST imposed on soya seed and soya meal, as the feed cost is increasing because of tax levied on soya meal and soya seed and this leads to the increase of the final product prices.

4. Government Initiatives to Support Egg production:

- 4.1. Currently most of the egg production activity is carried out in cages and modernized poultry housing systems. This helps in rearing egg laying birds in a disease-free environment which leads to better liveability and higher productivity. This higher productivity leads to lower egg production cost and the farmers are directly benefitted as it supports their earning potential. The customers and consumers are also directly benefitted, and their consumption will grow on account of affordability. Government is requested to continue to allow egg production activity in cage farms with flexible regulatory norms.

5. Government Support in Promoting Export opportunities:

- 5.1. Allowing the Poultry sector for duty free import of raw materials especially the corn.
- 5.2. Provide incentives for export of poultry products to promote exports and support Poultry sector growth.

Fisheries Sector

A) Background

- India is the second largest Fish producer and in the year 2018-19 13.42 Million tonnes has been produced.
- It contributes to 6.3% of the Global Production, 1% of the national GDP and 5% of Agriculture GDP, 7% Annual growth rate, 1.45 lac people employment opportunity has been created in the Fishery Sector.
- Present per capita consumption of fish in India is less than 5 Kg and the world average is more than 20kgs.

B) Problems Faced by Fisheries Industry

1. Resistance to accept exotic shrimp varieties like Vannamei
2. Presently shrimp is a fragmented Industry and integrated operators like Poultry should be promoted.

3. Consumption of fish in India is very less compared to other countries. In India the market size is 3.5 to 4 Million tonnes of production but the consumption is 1 million mt.
4. Quantity of shrimp export to European Countries is very less and there is no export strategy, which needs to be developed by government in consultation with the farmers.
5. Cost of production in Shrimp is high coupled with non-availability of disease resistant stock
6. No regulatory frame work to address issues related to shrimp and fish
7. 20 to 30% shortage of quality seed and feed.

C) Existing Schemes promoted by Government in Fisheries Sector

1. Government has introduced Blue revolution to integrate schemes for holistic development of the Fisheries Sector.
2. Financial allocation by the Government in the span of last 5 years is Rupees 3,000 crores and out of which only 2,400 crores has been utilized. The Infrastructure development fund for fisheries allocated is Rupees 75,000 crores.
3. For solving the working capital problems of the fish farmers, the Kisan Credit Card scheme of up to 2 lakhs is available.
4. The implementation of the Matsya Pradhan Mantri Sampada Yojana is under discussion and it will be introduced to tap the untapped potential areas, promote certified seeds, technology improvement, increase hatcheries etc.
5. There is also a discussion with World Bank to launch a scheme to bring in 2000 million USD of investment to promote fisheries and out of these 1000 million dollars should be derived from the private players and this fund can be utilized to create regulatory frame work and technical upgradation in the Fisheries sector. Thus, with the current growth rate in fisheries depicts a major growth driver to achieve doubling farmer's income.

D) Recommendations for Livestock and Fisheries:

1. Improve governance and policy framework in the Livestock and Fisheries Sector, create awareness

among the people about criticality of these Sectors and they should be promoted like entrepreneurship and serious business. Government policies should focus on creating an enabling eco-system to encourage entrepreneurship rather than merely administering subsidies. This would lead to sustainable growth.

2. Government to create awareness about feeding the animals with healthy feed for producing healthy animals.
3. Considering the huge size of population, the productivity and long-term growth has to be increased in a sustainable manner.
4. Create export opportunities to get rid of surplus. Government to introduce a regulatory framework for fisheries that will encourage exports.
5. Association like CLFMA to play an important role to connect the Industry with the government.
6. Shortage of good quality feed and seed is to be addressed by the government.

Dairy Sector

A) Background:

- India is the first largest producer of milk in the world
- India's current production of milk is in excess of its demand and is expected to be so till 2022-23. India also has one of the most economical milk prices in the world.
- Dairy is a source of income for over 100 million households, with 77% of total milk being produced by small, marginal and landless farmers

B) Problems faced by Dairy Industry

1. Threat in reduction of milk supply due to lack of better price for Milk
2. Dairy business is not yet commercialized in India
3. As on today also 80% plus dairy industry is like a backyard Farming and lacks knowledge about scientific feeding and management of lactating cows/buffalo leading to reduced milk supply and high feeding cost
4. Lack of Feed & Fodder Availability

5. FMD, Brucella, mastitis are the common diseases affecting milk yield and govt spends crores on vaccination. In other countries such animals are sent for slaughtering after vaccinating once and clearing the disease.
6. We go up 6 to 7 lactations whereby other countries after 3rd or 4th lactation it goes to slaughtering.
7. Very important aspect is production cost / per litre of milk is high.
8. Non-descript Indian breeds tend to be uneconomical compared to jersey/HF.
9. The cost of production is un-economical and hence farmer tends to Produce less milk.
10. With the whole scenario our dairy model is going towards low input low Output instead of high input high output model.
11. Lack of Clean Milk production leading to lack of creation of good export market for processed products.

C) Recommendations for Dairy

1. The government's policy of encouraging Indigenous breeds should be based on the rationale of economy and scientific data.
2. Government to take steps in promoting dairy farming business as a commercial enterprise and a strategy should be put in place by the government to work on breed improvements in the indigenous cows/buffaloes.
3. A) Government should offer choice to the farmers to take decision about choosing the breed of the animal, and incentives should be equal.
B) Government to create a policy to address milk adulteration and mixing of the milk of Desi Indian Cow breeds with milk of Exotic breeds.
4. Government may consider a milk price

stabilization fund to secure family owned milk farms

5. Government should discourage import of milk and milk products
6. Government should establish a robust programme of disease management.
7. A creation of Public Private Partnership Platform for dairy sector is the way forward. Government could establish a multi stakeholders' institutional framework, say Dairy Investment Promotion Board or use NDDB to ask for private players/ corporate/ SME / FPOs / Start-ups to come up with end to end projects for dairy development connecting disorganised dairy producers with dairy consumers through such investors. Government could provide all the assistance under various schemes for finance, production, collections, value added production and infrastructure. Entire country could have hundreds and thousands of such dairy value chains. Agri Start-ups could be the organisers of such value chains and earn /services charge/profits as well.
8. Recommendations and steps which government and Industry needs to take to improve milk yield in cattle should be a part of the value chain and ICAR institutions/ State Agriculture University/ KVK should be part of this partnership.
9. If fodder growers / FPOs are part of the above mentioned (Point 8) value chains and have assured market for fodder/ value added products, they would shift cultivation to fodder from competing crops if returns are higher/ comparable.
10. Government could look into the FPO model provided the FPOs are part of value chains on dairy. Viability would be decided by the business model of dairy value chains as devised by investors/ promoting institutions/ start-ups/ SME/ corporates.

Session-2

During the Second Session “**Value Addition with Special Focus on Processing**” was discussed in detail. The Session Moderator was **Mr. Narayanan**, Advisor – Food and Beverage. **The 2nd Session's Panellist** from the **Government of India** were **Shri J. P. Meena, IAS(Retd.)** former Secretary, Ministry of Food Processing Industries (MOFPI), **Dr. Amit Sharma**, Director, Food Safety and Standards Authority of India (FSSAI), **Shri Tarun Bajaj**, General Manager at Ministry of Commerce (APEDA) & from the Industry side **Mr. Vishwas Chitale**, Executive Director, Chitale Agro Industries Pvt. Ltd. represented Dairy Industry, **Mr. Ravi Kumar Yellanki**, Managing Director, Vaishaki Bio Resources & Vaishaki Bio Marine represented Fishery Industry & **Mr. Prashant Vatkar**, CEO of Godrej Tyson Foods Ltd. represented Poultry Industry. The Second Session deliberated the importance of Food processing in doubling farmers income, addressing the traceability issues, reduction of food wastage and Food safety Issues, promotion of Export Markets etc. were discussed in detail. The Summary of the deliberations are given below: -

A) Background

- Food Processing is one of the largest Industry categories in terms of Production, Consumption & Export
- Widely recognised as Sunrise Industry, estimated net worth 67 Billion US\$ and Employing 13 Million Directly & 35 Million Indirectly
- Indian Food & Grocery – 6th Largest in the world, expected to touch 482 Billion US\$ by 2020
- Indian Food processing – 32% of Food Market (14% Manufacturing, 13% Exports, 6% Industrial Investment)
- India's processing industry is highly fragmented and is dominated by the unorganized sector.

India's Agri base is quite strong but wastage is very high & processing of food products is very low.

- The country's processing sector is small and processing of food to consumable standards in India has reached only 10% recently. The processing level is around 2.2 % in F&V, 37% Dairy,

21% in Meat & 6% in Poultry products. While processing of food to consumable standards are at levels of up to 80% in some developed countries,

- The highest share of the processed food is in the Dairy sector, where 37 % of total produce is processed, of which only 15% is processed by the organized sector.

Poultry/Dairy/Fisheries

B) Problems faced by Poultry/Dairy/Fisheries Processing Sector

- Lack of consumer awareness levels about hygiene
- The present cost structure is like any other private sector and hence is leading the processing industry cost to be almost twice as much of a local butcher.
- Aflatoxin Issues at the feed production level
- Lack of proper food safety measures from the primary production level including feed production stages
- Increased cost of production and decreased productivity of animals
- Lack of production, processing and marketing infrastructure for meeting the international quality requirements
- Lack of Focus on Buffalo milk-based speciality Dairy industry in India.
- Problems in getting new breed stock into the country especially in shrimps.
- Improper disease management at hatcheries
- Traceability issues in case of finished products which leads to problems while exporting.

C) Recommendations of the session

Poultry:

1. Evolve a rating approach depending on the Microbial load of the meat from the processors
2. The cost structure can be eased in the following ways

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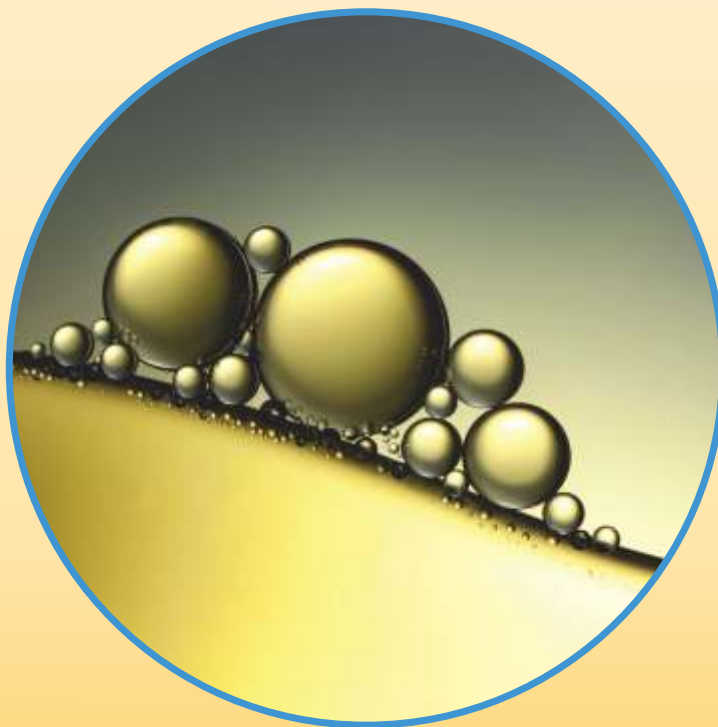


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- 2.1. Lower interest rates (like a priority sector)
- 2.2. Significantly reduce import and custom duty for equipment at processing plants as well as poultry operations
- 2.3. GST reduction/waiver for utilities like power, fuel, water including manpower
- 2.4. Subsidised rates for utilities particularly power and water
- 2.5. Affordable Insurance of Livestock in poultry
- 2.6. GST reduction/ waiver for Capital goods
- 2.7. Accelerated Depreciation on Energy savings equipment

Dairy

1. We should develop proper production, processing and marketing infrastructure, which is capable of meeting international quality requirements.
2. A comprehensive strategy for producing quality and safe dairy products should be formulated with suitable legal backup.
3. To focus on buffalo milk-based specialty products, like Mozzarella cheese,
4. Educating the people on Quality of dairy products

Fisheries

1. Need to bring in new Genetics in to the country.
2. Emerging diseases reported anywhere in the world should be added to the list of diseases to be checked at RGCA quarantine.
3. Need to establish breeding programs for indigenous species as well.
4. Government and industry to provide extension awareness in Disease Management Protocols viz. Regular up-dation of Hatcheries, disinfection protocols in maturation and larval rearing as well keeping emerging diseases in view., Avoiding antibiotics and using probiotics., Brood stock needs to be tested periodically for diseases of concern.

5. To establish a good market development strategy
 - 5.1. As a leading exporter, we need to have lion's share in EU market which is the leading importer of shrimps
 - 5.2. Development of Export market to move up the value chain by Value addition and establishing distribution network in the market place.
 - 5.3. The domestic market needs to be strengthened by way of establishing cold chains and processors also should take a lead in this activity.

D) Other Recommendations

1. Government to implement stringent food safety measures from the primary production level including animal feed production for dairy, aqua, poultry and other animals.
2. Government-MOFPI has schemes like Kisan Sampada Yojana, Mega Food Park Schemes and Mini Mega Food Park Schemes and the industry can take advantage of this.
3. Government to address adulteration in a stringent manner.
4. Industry to promote Voluntary regulatory compliance at all levels of the value chain
5. Government should introduce Food safety ratings like ISI and consumers should be educated about these ratings
6. Antibiotic residue levels should be monitored at every stage of the value chain to promote exports. This quality has to be adhered to the domestic market as well.
7. To promote Indian ethnic foods for export like from Ahmedabad frozen paratha and from Indore frozen halwa and samosa is being exported.
8. Government needs to support the concept of creating disruption by data analysis and bring a realignment.

Session-3

The Third session was titled as “**Livestock Industry Interaction with Government** “. The Third Session Moderator was **Mr. Bharat Tandon**, Past Chairman of CLFMA & Managing Director of Healthline Pvt. Ltd. (Sericare Division). From the **Government of India**, the Panellists were **Shri. Dr. O.P. Chaudhary**, Joint Secretary (NLM), Dept. of National Livestock Mission, Ministry of Fisheries, AH&D, **Shri. G. N. Singh**, Joint Secretary – Trade, Department of AH&D & **Shri. Keshav Chandra**, Joint Secretary, Department of Commerce, Ministry of Commerce and Industry and from **CLFMA Team** **Mr. S.V. Bhawe**, Chairman, **Mr. Neeraj Kumar Srivastava**, Dy. Chairman, **Mr. Naveen Pasuparthi**, Treasurer, **Mr. Divya Kumar Gulati**, Secretary, and **Mr. Suresh Deora**, President – West Zone. In this session, the Industry Pain Points were discussed with the Government.

A free-range discussion took place in this session wherein various doubts and issues were raised by the industry representatives and necessary clarifications were given by the officers of the government. The highlights of the discussions are given below: -

1. The methodology of crop sowing and area estimation by the government were discussed in detail.
2. Problems related to Port Clearance viz causes of delays, cumbersome process, increase of cost paid by the importers due to demurrages etc for additives & vitamins imported into India for animal feed industry were deliberated.
3. Apart from this Standardization of paperwork & process at all ports for ease of transaction was discussed. Also, the issues related to the availability of all the Feed Additive Lists at all the ports at the same time were discussed.

4. Reduction of the import duty range of 30-35% imposed on import of equipment and machineries related livestock sector which enables improving material handling efficiency was deliberated in detail
5. Reduction of import duty from 20% to 5 % on feed additives by the government for making Indian livestock industry competitive domestically & internationally was also discussed
6. Creation of more certifying infrastructure like (one Plant quarantine facility, Ghaziabad GOI. & One Bhopal lab facility) for exporters were discussed in detail
7. The government's mechanism to act on commodity price rise due to forward trading was also discussed in detail
8. There was also a discussion about allocation of 1% urea quota to help dairy feed manufacturers and also reduction of 28% GST for Molasses used in animal feed industry

The senior officers from different ministries and departments also took note of the suggestions made by industry representatives and assured that these would receive highest consideration while making appropriate policies.

The Valedictory Session was conducted by Shri. Tarun Shridhar, IAS(Retd.) Former Secretary, Department of Animal Husbandry and Dairying (AH & D), Ministry of Fisheries, AH&D followed by Felicitation to all Sponsors, Media, Guests and Invitees.

The vote of thanks was proposed by Mr. Suresh Deora, President – West Zone.

52nd CLFMA AGM was conducted on 22nd August 2019 at Hotel Le Meridien, New Delhi. Majority of CLFMA Members attended the Annual General Meeting.



Registration of Delegates



Arrival of Chief Guest Shri Giriraj Singh, Hon'ble Union Minister of Fisheries, AH & D, GOI.



Chief Guest Shri Giriraj Singh, Hon'ble Union Minister of Fisheries, AH & D, GOI at CLFMA Symposium 2019



Chairman, Mr. S. V. Bhawe Felicitating Shri Giriraj Singh, Hon'ble Union Minister of Fisheries, AH & D



Mr. S. V. Bhawe Delivering Chairman Address



CLFMA Chief Guest Shri Giriraj Singh, Hon'ble Union Minister of Fisheries, AH & D in CLFMA Symposium 2019



Audience



Audience



Chief Guest Address delivered by Shri Giriraj Singh, Hon'ble Union Minister of Fisheries, AH & D



CLFMA Nutritional Guidelines released by Hon'ble Union Minister of Fisheries, AH & D, Shri Giriraj Singh



Shri Giriraj Singh, Hon'ble Union Minister of Fisheries, AH & D with Chairman, Mr. S. V. Bhawe & Secretary, Mr. Divya Kumar Gulati



Felicitations of Hon'ble Union Minister of Fisheries, AH & D, Shri Giriraj Singh by Chairman & Secretary



Welcome Address by Mr. Divya Kumar Gulati, Secretary



Press Meet of Hon'ble Union Minister of Fisheries, AH & D, Shri Giriraj Singh



Mrs. Chandrika Venkatesh, Executive Director, Welcoming all Office Bearers on the Dias for AGM



CLFMA Activities for the whole year presented by Chairman Mr. S. V. Bhawe

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Treasurer Mr. Naveen Pasuparth presenting Financial Updates



CLFMA 52nd AGM & Symposium – Office Bearers on Dias



AGM Concluded by Secretary Mr. Divya Kumar Gulati



Audience



AGM Q & A Session



AGM Q & A Session



Inaugural Session Dias



Mr. S. V. Bhavé Chairman Felicitating Shri. Pawan Agarwal, CEO, Food Safety and Standards Authority of India (FSSAI), GOI.



Mr. Divya Kumar Gulati, Secretary, Felicitating Shri Atul Chaturvedi, Secretary, Dept. of AH & Dairying, GOI



Mr. Divya Kumar Gulati, Convenor of Symposium 2019 giving Welcome Note



Inaugural Session Dias



Inaugural with walking violinist Mr. Aneesh Vidyashankar



Shri Pawan Agarwal, CEO, Food Safety and Standards Authority of India (FSSAI), GOI., inaugurating 61st National Symposium 2019



Shri Atul Chaturvedi, Secretary, Dept. of AH & Dairying, GOI at inaugural of 61st National Symposium 2019



Chairman Address by Mr. S. V. Bhavé



Shri Atul Chaturvedi, Secretary, Dept. of AH & Dairying, GOI. delivering Thematic Address



Mr. Divya Kumar Gulati, Secretary, presenting Shawl & Memento to Shri Atul Chaturvedi, Secretary, Dept. of AH & Dairying, GOI



Shri Pawan Agarwal, CEO, Food Safety and Standards Authority of India (FSSAI), GOI, delivering Keynote Address at Inaugural Session



Chairman Mr. S. V. Bhavare felicitating Shri Pawan Agarwal, CEO, Food Safety and Standards Authority of India (FSSAI), GOI, with Shawl & Mementos



Mr. Bharat Tandon, Past Chairman & MD, Healthline Pvt. Ltd. (Sericare Division) welcoming CLFMA Awardees



CLFMA Lifetime Achievement Awardee - Shri P. S. Nandakumar, Chairman & MD, Nanda Group



Shri Atul Chaturvedi Secretary Dept. of AH & Dairying GOI felicitating Shri P. S. Nandakumar, Lifetime Achievement Awardee



Mr. P. S. Nandakumar with Shri Atul Chaturvedi & Shri Pawan Agarwal



Mr. P. S. Nandakumar, CLFMA Lifetime Achievement Awardee addressing at Inaugural Session



Mr. Suresh Deora, President - West Zone welcoming CLFMA Awardee Dr. Ashish Paturkar, Hon'ble Vice Chancellor, MAFSU, Nagpur



Shri Atul Chaturvedi presenting Shawl & Mementos to CLFMA Awardee Dr. Ashish Paturkar Hon'ble Vice Chancellor, MAFSU, Nagpur



Mr. Prashant Vatkar, CEO, Godrej Tyson Foods Ltd. welcoming CLFMA Awardee Dr. Ashok Kumar, ADG-ICAR



CLFMA Awardee Dr. Ashok Kumar, ADG-ICAR with Shri Atul Chaturvedi, Secretary, Dept. of AH & Dairying, GOI



CLFMA Awardee Dr. Ashok Kumar, ADG-ICAR felicitated by Shri Atul Chaturvedi, Secretary, Dept. of AH & Dairying, GOI



Mr. Abhay Shah, Director, Spectoms Engineering Pvt. Ltd. & CLFMA MC Member welcoming CLFMA Awardee Dr. Raghavendra Bhatta, Director, ICAR.



CLFMA Awardee Dr. Ashok Kumar, ADG-ICAR felicitated by Shri Atul Chaturvedi, Secretary, Dept. of AH & Dairying, GOI



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Vote of Thanks by Mr. Neeraj Kumar Srivastava,
Dy. Chairman, CLFMA OF INDIA



Audience – Session I



Welcome Address by Treasurer Mr. Naveen Pasuparth
at Symposium 2019



Moderator Mr. B. S. Yadav, Past Chairman and
MD of Godrej Agrovet Ltd. at Symposium 2019,
Session I welcoming all Panelist



Symposium 2019 Session I Panelist on Dias



Moderator Mr. B. S. Yadav, Past Chairman and MD
of Godrej Agrovet Ltd.



Shri. Tarun Shridhar, IAS (Retd.) Former Secretary,
Dept of AH &D, 1st Session Panelist



Mr. Ravi Kumar Yellanki, Managing Director, Vaishaki Bio Resources
& Vaishaki Bio Marine, 1st Session Panelist

* Symposium 2019 Session I - "Doubling Farmers' Income: Government and Industry Partnership"



Mr. B. Soundararajan, Past Chairman and Chairman, Suguna Holdings Pvt. Ltd., 1st Session Panelist



Shri. Sagar Mehra, Joint Secretary, Dept. of Fisheries, Ministry of Fisheries, AH & D, 1st Session Panelist



Q & A Session of 1st Session



Q & A Session of 1st Session



Q & A Session of 1st Session



Mr. Daljit Singh, Chairman PDFA, 1st Session Panelist



Audience



Audience



Mr. Sumit Sureka, Dy. Chairman felicitating
Shri. Sagar Mehra, Joint Secretary, Dept. of Fisheries,
Ministry of Fisheries, AH & D



Mr. Amit Saraogi, Past Chairman felicitating
Shri. Tarun Shridhar, IAS (Retd.) Former Secretary, Dept of AH & D.



Mr. Neeraj Kumar Srivastava,
Dy. Chairman felicitating Mr. Daljit Singh, Chairman PDFA



Dr. Devender Hooda, CLFMA President – North Zone
felicitating Mr. Ravi Kumar Yellanki Managing Director,
Vaishaki Bio Resources & Vaishaki Bio Marine



Mr. Nissar F. Mohammed, CLFMA MC Member
felicitating Mr. B. Soundararajan, Past Chairman and
Chairman, Suguna Holdings Pvt. Ltd.



Mr. Abhay Shah, Director, Spectoms Engineering Pvt. Ltd.
& CLFMA MC Member felicitating Mr. B. S. Yadav,
Past Chairman and MD of Godrej Agrovet Ltd.



1st Session Moderator and Panellists



Mrs. Chandrika Venkatesh, Executive Director and
Mrs. Shilpa Utekar, Manager at Symposium 2019



Moderator Mr. K. S. Narayanan, Advisor – Food and Beverage at Symposium 2019, Session IInd welcoming all Panelist



Shri. Tarun Bajaj, General Manager, APEDA, IInd Session Panelist



Dr. Amit Sharma, Director, FSSAI, IInd Session Panelist



Q & A of IInd Session



Q & A of IInd Session



Q & A of IInd Session



Dr. Dinesh Bhosale, Past Chairman and Regional Sales Director of AB Vista South Asia felicitating Shri J. P. Meena, IAS(Retd.), Former Secretary, MOFPI, IInd Session Panelist



Dr. Dinesh Bhosale, Past Chairman and Regional Sales Director of AB Vista South Asia felicitating Dr. Amit Sharma, Director, FSSAI, IInd Session Panelist.

* Symposium 2019 Session IInd - "Value Addition with Special Focus on Processing"

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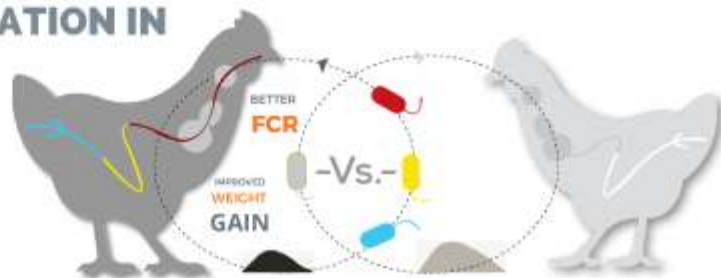


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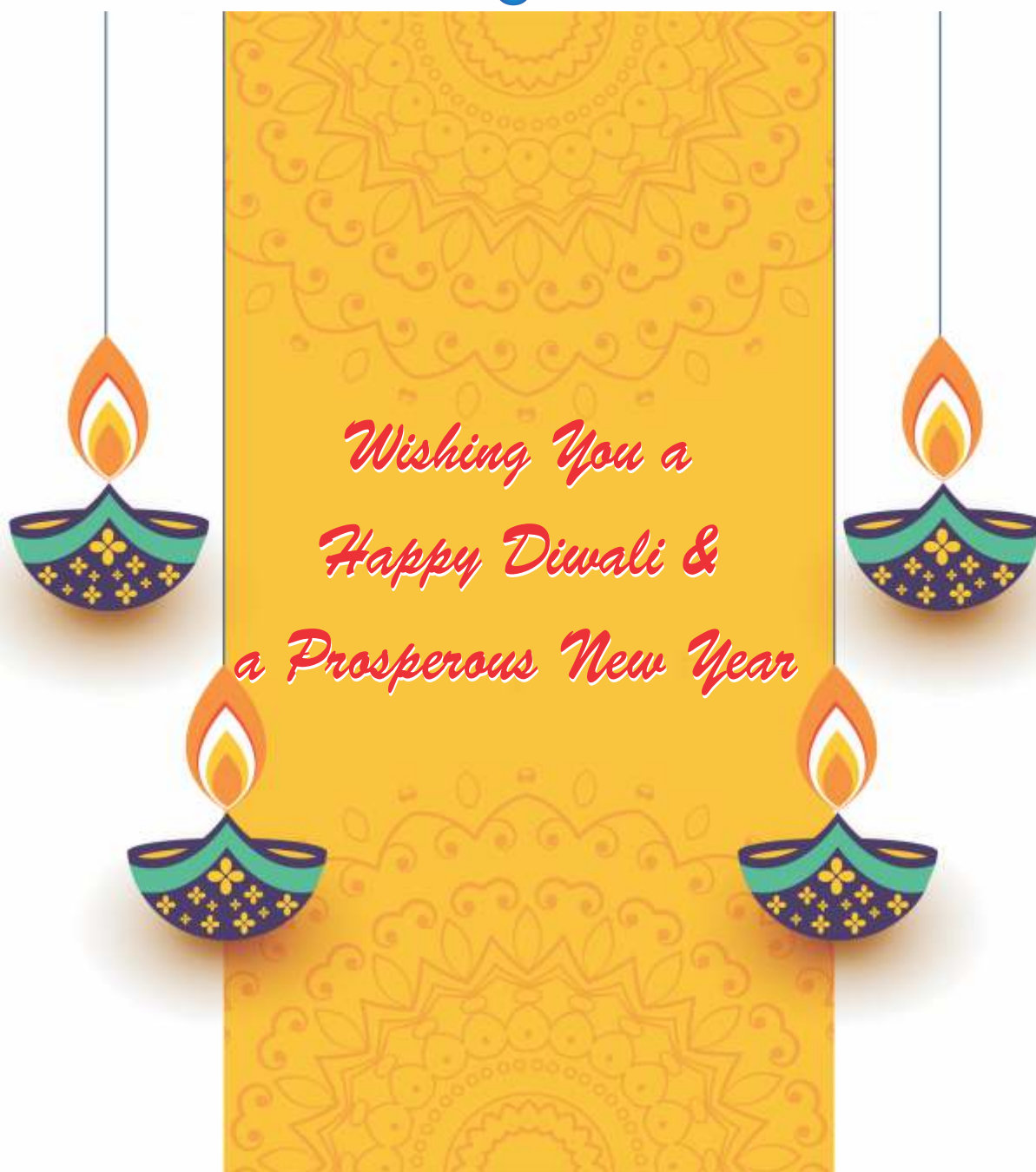
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Crop Residues an Undervalued and Overlooked Feed Resource

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Introduction

Crop residues since ages have been a major feed resource and in years to come it will continue to be a major feed resource. The reason being that crop residues are obtained as byproducts of food crops and as long as the food crops are cultivated to fulfill the food security of growing population availability of crop residues would be continued. Further unlike other resources crop residues do not compete for precious land and water resources which are already limited. In spite of being the largest feed resources it has not got its due attention for a number of reasons like bulkiness, poor nutrient density, low intake, digestibility and high transport costs. In spite of the several limitations it continues to be a major resource as traditionally it has been used since ages, is readily available with farmers at his door step at no cost as it's a farm produce and is capable of supporting low and medium producers with little supplementation with greens and other byproducts like brans, chunies and oil cakes.

In years to come importance of crop residues will continue to grow for the simple fact that there is already deficit of feed resources and further the demand for livestock products is growing steadily and this demand cannot be fulfilled by concentrates and green fodder given the limited land mass. Crop residues are becoming important as evidenced by considerable resources spent in gathering, and transporting across long distances- almost 300-km from rural areas to peri urban dairies, mushrooming of crop residue traders and growing monetary value of crop residues., narrowing grain to straw ratios in terms of monetary value and price premium for quality straws in fodder markets (Blummel & Rao, 2006, Teufel et al., 2010).

Crop residue availability

Availability of crop residues is generally arrived by multiplying the grain production data with grain to straw ratios. Different crops tend to have different ratios and by using appropriate factors the total availability of crop residues for major crops like rice, wheat, jowar, bajra, maize,

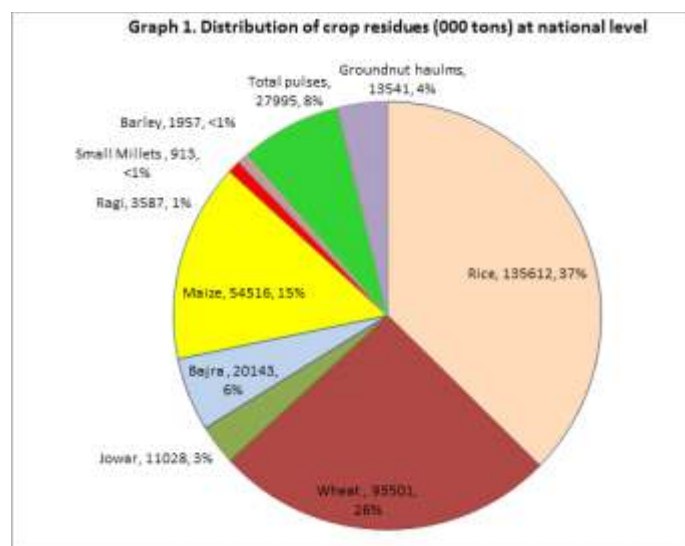
ragi, small millets, barley, pulses and groundnut for the period 2015 has been worked out for different states and the country. The corresponding conversion factors or grain to straw ratios used for calculation were 1.3, 1.0, 2.5, 2.5, 2.5, 2.0, 2.5, 1.3.1.7 and 2.0 respectively. State wise availability of crop residues for different states is presented in Table 1.

Table 1.State wise availability of crop residues (2015)

States	Crop residues (000 tons)
Andhra Pradesh	18047
Assam	7070
Bihar	19960
Chhattisgarh	9533
Gujarat	14137
Haryana	18756
Himachal Pradesh	2618
Jammu & Kashmir	2297
Jharkhand	5949
Karnataka	20713
Kerala	730
Madhya Pradesh	41094
Maharashtra	15177
Orissa	9074
Punjab	32636
Rajasthan	29569
Tamilnadu	21446
Telangana	9220
Uttar Pradesh	53538
Uttarakhand	2281
West Bengal	24228
Others	4706
All-India	362793

The distribution of crop residues from different crops is presented in the pie chart. Among the crop residues at the country level rice straw is the largest resource accounting for 36% of the total crop residues followed by wheat -27%, maize, 15%, total pulses 8%, bajra 6%, groundnut haulms 4%,

jowar 3%, ragi 1% and rest below 1%.



Improvement of crop residue quantity and quality

Research efforts in terms of treatments for improving the nutritive value of crop residues have not been very successful so far. Urea ammoniation of crop residues was tried extensively over several years under different location but somehow it did not find favor with the farmers and once the support from the project ceased treatment of crop residues were discontinued. Research focus for improving the crop residues nutritive value shifted from treatments to breeding where it was realized by nutritionists that not all crop residues are same and within each crop there is significant differences in the quantity and quality of crop residues in all the major cereals, pulses and oil seed crops. Close collaboration between the crop breeders and livestock nutritionists resulted in realization of the fact that the varieties with superior grain yields can be developed without compromising the yield and quality of the crop residues. This approach resulted in evolving of dual purpose food –feed crops and the focus of the crop breeders started including the crop residue feed attributes. International Livestock Research Institute based in India pioneered the work on food feed crops in India and almost all crops like sorghum, pearl millet, groundnut, maize, rice, wheat documented the differences in the fodder attributes of crop residues. Differences in the quality of crop residues as well as the quality in terms of digestibility were found to be quite significant and the differences were also found to result in significant production responses in terms of growth or milk production. Small differences in digestibility of crop residue based basal diets can have significant impact on the livestock

productivity. Anandan et al., (2010) reported a higher milk potential of 5.5 to 7kg/day in milch buffaloes fed total mixed diets having 50% superior sorghum stover vis a vis the normal stover (5% difference in digestibility). More often these differences already exist across the varieties and by mere documentation these differences could be exploited by selectively promoting superior dual purpose crops. In fact the differences in the quality of crop residues are well documented and both traders and farmers tend to pay more for the crop residues with higher digestibility. Further it was found that most of the positive fodder quality attributes in many crops had medium to moderate heritability and these attributes could be improved through plant breeding approaches without any significant negative consequences on the grain yield (Sharma et al., 2010).

Processing in terms of fine chopping/grinding with supplementation in terms of total mixed rations- mash or feed block has positive production response but the handling /processing costs are not economical. Few of the commercial enterprises across different parts of country established commercial processing plants in Uttarakhand, Karnataka, Telangana and Haryana to produce fodder block incorporating processed crop residues have not been very successful due to high production cost and other difficulties in logistics.

The quest for improving the crop residue nutritive value will continue, given the fact that there is huge quantity available every year and there is deficit of feed resources leading to strong market demand for feed resources. In this direction the few of the patented technologies like AFEX, second generation biofuel technologies like the technology of chemical treatment developed by Indian Institute of chemical technology (IICT) and steam treatment developed by Natarajan Fertilizers reported by Blummel et al (2018a) are worth considering.

Ammonia Fiber Expansion (AFEX) technology was developed by Dale and Weaver (2000) and involves controlled ammonia treatment of crop residues under elevated temperatures and pressures with recovery of ammonia (Campbell et al., 2013). The treatment results in alteration of physical and chemical structure of the biomass (Dale and Moreira, 1982; Balkan et al., 2009). AFEX pretreatment alters lignin structure, increases surface area accessible to enzymes, and only partially degrades hemicellulose and lignin, allowing for easy digestion by microbes (Chundawat et al., 2011). Dry matter recovery following AFEX treatment is essentially 100%, and treated biomass is stable and can be densified into storable, shippable pellets. Blummel et al (2018b) evaluated the effect

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of AFEX treatment on ten crop residues from India and reported that AFEX treatment consistently and significantly increased in vitro gas production (42.9 vs 33.3 ml/200 mg), in vitro apparent digestibility (49 vs 63 %) and true digestibility (62 vs 76 %) and in vitro metabolizable energy content (6.9 vs 8.6 MJ/kg). Although the AFEX treatment was quite effective in improving the nutritive value of crop residues, safety concerns due to presence of breakdown products in AFEX treated samples has been a concern. Efforts are on to study the safety aspects of these break down product and if the safety of the process is assured than the technology of AFEX can be a potential breakthrough in utilization of crop residues. Comparing the three potential treatments based on steam treatment, AFEX and chemical treatment (IICT method) Blummel et al., (2018b) reported Increments in true IVOMD of 9, 19 and 38% units. These increases should be viewed in the light of report by Vogel and Sleper (1994) wherein a 3-5% improvement in digestibility was associated with improvement in livestock productivity by 17-24% and the findings of Anandan et al., (2010) in productivity of milch buffaloes fed with sorghum stover having different digestibility. The treatments of IICT and AFEX are potential game changers in the sense that the improvement in crop residues would put them on par with the concentrates.

Policy support for optimal utilization of crop residues

Given the overwhelming importance given to food security, crop breeders have always given high priority for grain yields as the criteria for release of new varieties and all these years grain yields has been the main criteria without any weightage for fodder attributes. However over the years with gradual realization of importance of crop residues crop breeders have started realizing the importance of fodder attributes and fodder attributes as selection criteria needs to be included along with grain yields. Release criteria for new varieties of food crop especially those crops where the crop residues have an important role as fodder source, should include fodder attributes as additional criteria. Not all the crop residue that is potentially available is used as fodder resource and there are multiple ways by which the potential resources is lost or diverted for other uses. Best example of wasting of the precious fodder resource is the burning of paddy straw in Northern India especially in the states of Punjab parts of Haryana and western Uttar Pradesh leading to air pollution and respiratory disorders. The state governments have taken active role in minimizing this practice by creating awareness, imposing penalties and providing alternate technologies like happy seeder that helps in recycling of the paddy straw without burning. However they have not been very effective

and efforts needs to be continued to achieve total compliance. Greater efforts is required through better policy support and incentives in conserving the precious feed resource and promote its utilization in areas that are chronically deficit in feed resources.

Diversion of crop residues to other non-feed uses is another area of concern- some of the crop residues are used in packing industries and also the government of India is promoting power generation units based on the biomass from the crops. While certainly not all crop residues is fit for odder purposes, diversion of valuable feed resource for the packaging industries or power generation is avoidable and policy needs to be in place to allow only inedible crop residues for industrial/power generation and other non-feed industrial uses. Given the drudgery involved in harvesting of grains from food crops harvesting machines are being developed that are labor friendly and time saving. While developing the harvesting machines, care should be taken that along with the grains the crop residues harvesting is also taken care so that harvesting machines used for of grains do not compromise with the crop residues availability. Currently Indian dairy sector is mainly driven by small holders having 2 to 3 low to medium producing animals mainly fed on crop residue based diets. In near future this may not change very drastically due to limitation in terms of the availability of concentrates and greens and dairy sector would continue to depend on the crop residues and there is need for promoting the utilization of crop residues and enriching the nutritive value through multi-pronged approaches starting from plant breeding to enrichment to processing. Currently there are very few feed industries engaged in the crop residue processing given the multiple challenges like low density, low economic value poor nutrient density and high cost of processing. Considering the important role of crop residues government should promote the use of crop residues through financial incentives and policy support for processors engaged in promoting crop residue as feed resource.

Conclusions

India is the largest milk producer globally and among all the livestock sectors in India, dairy happens to be the largest sector. Dairy sector In India is the largest consumer of crop residues and is still dominated by the small and medium producers who predominantly depend on the crop residues that are produced as crop byproduct and is readily available with the farmers. Increasing demand for milk in India is likely to put strain on the already available limited

quantities of concentrates and green fodder and it is very likely that crop residues will continue to play a major role in bridging this gap. Considering the inherent limitation of the crop residues in terms of low nutrient density, bulkiness and low palatability, all these years crop residues has been a neglected feed commodity. However considering the reality in terms of the demand supply scenarios for feed supply across different regions and the limitation in augmenting concentrates and green fodder supply in the country, it's more meaningful and important to make use of the available crop residues optimally. This calls for a multi-pronged approach bringing together the nutritionists, crop breeders, processors, feed compounders, planners, policy makers and financiers in working towards the common objective.

Different components of this multi-pronged approach would broadly include- identifications of varieties with superior fodder attributes, breeding and promoting dual purpose food feed crops, including the fodder attributes as additional criteria for release of new varieties, policy incentives to discourage burning and diversion of crop residues for non-feed uses, smarter processing machines to handle crop residues during harvesting and post harvesting operations, incentives to feed processors engaged in processing crop residues and promoting R & D efforts in upgrading the nutritive value of crop residues and their up scaling for commercialization.

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Ceva Polchem Pvt. Ltd.....	33
Delacon.....	3
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Evonik Industries.....	74
Godrej Agrovet Limited	2
Huvepharma	90
Indian Trading Bureau Pvt. Ltd.....	89

Japfa Comfeed India Pvt. Ltd.....	20
Kemin Industries	39
Nanda Group	28
Neospark.....	53
Noble Vetscience LLP, India	80
Novus.....	73
Organo Fertilizers (India) Pvt. Ltd.	54
Perfect Feedchem Pvt. Ltd.	66
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Provimi Animal Nutritional India Pvt. Ltd.	46-47
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Volschendorf.....	40
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Zydus Animal Health.....	65

Role of Nano Particles in Broiler Production

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Tamil Nadu Veterinary and Animal Sciences University
Namakkal- 637 002

Introduction

In the recent past, various strategies have been explored to reduce the feed cost of poultry by reducing the cost of mineral supplementation. Nano form of supplementation increases the surface area which possibly could increase absorption and thereby utilization of minerals leading to reduction in the quantity of supplements and ultimately reduction in feed cost. Mineral nanoparticles will be helpful in reducing the excretion of unutilized minerals, thereby minimizing the environmental pollution especially in large scale poultry farming. Nanotechnology is concerned with materials whose structures exhibit significantly novel and improved physical, chemical, and biological properties due to their nano-scaled particle size. National Nanotechnology Initiative (NNI) defined Nanotechnology as “utilization of structure with at least one dimension of nanometer (nm) size for the construction of materials, devices or systems with novel or significantly improved properties due to their nanosize”. In simple terms, nano mineral particles refer to the particles having a particle size of the range of 1-100 nm.

Properties of Nano Minerals

Nano minerals are essentially having a particle size of 1-100 nm. These are stable under high temperature and pressure. Easily absorbed by the gastrointestinal tract and utilized in the bird's system. Better interaction with other organic and inorganic substances due to more surface area, and minimizes the adverse effect on human cells. Nano minerals can cross the small intestine and further distribute into the blood, brain, lung, heart, kidney, spleen, liver, intestine, and stomach. Intrinsic properties of nanometals are mainly determined by its size, shape, composition, crystalline structure, and morphology. The functional activities such as chemical, catalytic or biological effects of nano minerals are heavily influenced by their particle size.

Methods to Prepare Nano Particles

Nanoparticles has created a huge demand, which leads to develop some effective and sensitive methods to synthesize.

The prime aim of synthesizing these nano minerals is to have a better control over particle size, morphology, purity, quantity, and quality. Nano minerals can be synthesized by the following methods. 1.Physical 2.Chemical and 3.Biological

In general, biological methods are safe to use. Nanoparticles can be produced by any one of the above methods but thorough study including toxicological effect is advocated before using these particles in the ration of broiler. Over the past several years, plants, algae, fungi, bacteria, and viruses have been used for the production of low cost, energy-efficient, and non-toxic nano mineral particles. Various metal nanoparticles such as silver, gold, cadmium, selenium, palladium, barium titanate, and titanium has been successfully synthesized by biological methods by using different plant materials but the biosynthesis of Zinc oxide nanoparticle is in infancy. Sindhura *et al.* (2014), prepared nano Zn by using leaves of *Parthenium hysterophorous*. Metal nano mineral particles have been successfully synthesized from *Avena sativa*, *Azadirachta indica*, *Aloe vera*, alfalfa, lemongrass, *Sesbania drummondii*, papaya fruit extract, and latex of *Jatropha cutcas*.

Effect of nanoparticles on the broiler production

Nanoparticles acts on the organisms in the gut (gut microflora). Nano-silver is an effective killing agent against a broad spectrum of Gram negative and Gram positive bacteria including antibiotic-resistant strains. Gram negative bacteria includes genera such as *Acinetobacter*, *Escherichia*, *Pseudomonas*, *Salmonella* and *Vibrio*. Silver nanoparticles anchor and penetrate the cell wall of Gram negative bacteria. Vijayakumar *et al.*, (2014) studied the effect of calcium phosphate nanoparticles supplementation on the growth performance of broilers and concluded that supplementation of 50% calcium phosphate nano particles can be practiced instead of dicalcium phosphate in broiler diet result in reduction of the cost of feeding.

Dietary mixture of *Aspergillus* probiotic and selenium nanoparticles were administered in broilers (Saleh *et al.* 2014)

and observed an increase in body weight gain and breast muscle weight when compared to control. Nano zinc along with inorganic, organic zinc was supplemented in broiler chick's organic zinc and nano zinc was beneficial in growth performance and feed conversion ratio and can be substituted for each other (Sahoo *et al.* 2016). Supplementation of nano selenium had a marked effect on selenium content in broiler liver and muscle (cai *et al.* 2012). Similarly injection of in ovo nano silver, thyme and savory extracts in broiler breeder eggs on 5th day of incubation and reared the birds upto 21 days and recorded no significant effect on growth rate and feed conversion ratio at 14 and 21 days of age. Nano zinc along with inorganic, organic zinc was supplemented in broiler chicks (Sahoo *et al.* 2016) organic zinc and nano zinc was beneficial in growth performance and feed conversion ratio and can be substituted for each other.

Effect of nanoparticles on the gastro intestinal tract

1. Silver has been used as salts (ionic form), mainly nitrate, sulphate or chloride. Silver chloride in the stomach or bloodstream is less effective and can form complexes with various ligands. Silver nitrate is unstable, and can be toxic to tissues (Atiyeh *et al.*, 2007). Silver compounds have been historically used as anti microbial, antifungal and antibacterial effect of silver nanoparticles, even against antibiotic-resistant bacteria has been demonstrated in vitro conditions. Yoon *et al.* (2007) observed a higher effect of silver nanoparticles on *Bacillus subtilis* than on *Escherichia coli* while Singh *et al.* (2015) reported higher sensitivity of

Gram negative bacteria to treatment with nanoparticles. The possible effects of metallic silver and silver ions over microorganisms from the digestive tract are scarcely documented. The selective response of silver in such ecosystem, with a wide diversity of species that can exert either symbiotic (positive) or pathogen (negative) effects, deserves further attention.

2. Cho *et al.* (2005) showed that either gram positive (*Staphylococcus aureus*) or gram negative bacteria (*E. coli*) are sensitive to silver nanoparticles. They observed strong antibacterial activity of a Ag-nano solution stabilized with poly-(N-vinyl-2-pyrrolidone) with minimal inhibitory concentrations at 5 mg/kg and 10 mg/kg for *Staphylococcus aureus* and *E. coli*, respectively. Bacterial cell walls are disrupted after treating with Ag-nano. Sawosz *et al.*, (2007) reported Ag-nano did not influence *Enterococcus faecium*, *E. coli* and other enterobacteriaceae.

Conclusion:

1. To conclude, nano minerals can be synthesized by physical, chemical and biological methods. In general biological methods are safe to use and can be efficiently exploited without further experiment on residual effect.

2. Studies so far have indicated that the application of nano minerals in animal production, immunity and reproduction is promising. However, application of nano minerals in this field is immense. The safety aspects of application of nano-minerals need to be addressed before being applied.



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By Aerin Einstein-Curtis, 14-Feb-2017

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NIR technology is moving beyond analysis of traditional components such as fibre and protein to include measurements of phytate, energy and reactive lysine, says AB Vista.

The company works with near infrared (NIR) technology as way to help customers format their feeds more precisely and avoid wasting essential nutrients, said Glison Gomes, global technical manager, AB Vista.

We caught up with him at the International Processing and Packaging Expo (IPPE) in Atlanta to hear more about how the technology can be used for precision feeding, and what new uses may be available in the future.

"This [NIR analysis] service allows the customer to better understand the key ingredient that is the cereal, and therefore utilize it wisely," he said. "We don't want our customers to have to put in an extra safety margin, we want them to be precise [and] to have better profitability."

NIR analysis can be used to screen amino acids now, he said.

"In the past it was not possible to analyze amino acids, and then with better technology, better computational software we're able to measure tiny things in the feed or in the feedstuffs," he added.

"In the beginning everyone was skeptical about NIR; it is only recently that everyone has been keener to use and understand it," he said. "Also computational technology has evolved a lot – you are now able to carry out data transformation to increase the precision of this technique."

Energy capture

One goal of using NIR tools in feed formulation is to ensure that nutritional elements in a feed are not wasted, said Gomes. For example, if a producer knew that two loads of corn being used to make a feed offered different energy levels, they could select the one required for optimal animal performance, he said.

The energy value of different cereals can vary by 360 kcal/kg, said AB Vista, while phytate levels vary not just between feedstuffs but also within a single raw material.

The technology also allows producers to evaluate feed ingredients coming from different locations, said Gomes. It also allows them to both specify and verify that feed ingredients contain certain elements.

"We have a big database of raw materials coming from different countries and for instance some companies import corn from the US, from Argentina, and from Brazil and then you can see the differences," he said. "I can pay a little bit more for supplier a, b or c because the quality of their feedstuff is a little bit better, or there is more protein or more energy."

Mixed feed analysis

One recent advancement in NIR technology has been to allow for the analysis of mixed feeds rather than single feed ingredients, said Gomes. However, it is still a common misconception that ingredients have to be examined individually.

"There is still misunderstanding about NIR," he said. "The technology picks up the vibration of molecules, so organic molecules vibrate and this happens regardless of if they are alone or if they are in a mixture. So in reality, if you have a very good database and a very good calibration, you will be able to pick up differences or vibrations even in complete feed."

Although NIR technology to track potential anti-nutrients, such as mycotoxins, is not available yet, that is being explored, said Gomes.

Eventually the ability to analyze the nutritional elements or qualities of a feed ingredient could allow feed mills the chance to channel ingredients by grade, said Gomes. But facilities would likely need to significantly increase the number of silos or storage options to make use of that process, he added.

He said improved computer processing speeds would enable feed mill mixing systems to both evaluate feed ingredients as they are brought into a facility and to modify feed formulations as needed: *"We don't have fast enough computers and*

systems to make all of this happen, but people are using these technologies in milk [analysis] – so you have this sort of inline stuff going on with more simple models and that I do believe this will happen soon in the feed industry."

AB Vista: "Currently used for basic raw material and feed quality control, new advances in NIR software and hardware are set to deliver commercially viable systems capable of in-line and real-time monitoring of feedstuff and feed nutrient content and physical characteristics. Losses associated with feed ingredient variability can be reduced, feed formulations can be amended and the quality of completed diets continuously monitored."



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Quality Control of Poultry and Pig Ration for Efficient Egg and Meat Production

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Introduction

The purpose of quality control is mainly concerned with determining and applying a feasible method with regular professional plan, which would certainly provide the acceptability of raw and finished products as per prescribed essential standards. The importance of quality control is related with the beginning of procurement of raw materials in the farms/factory to export of the product. Feed ingredients should be routinely evaluated to ensure they are safe, they contain the correct amount of the specified nutrient, and to ensure the finished feed quality will optimize animal performance. Permitted analytical variation (PAV) guidelines help to identify deficiencies or excesses of an in a product. If the assay indicates the ingredient is outside the PAV, the feed does not conform to label requirements.

Quality control in feed production is of utmost importance in the success and profitability of animal enterprises. There is no other directly or indirectly related to the proper nutrition and high performance of animals, which is more critical than feed quality control and ration consistency. Quality has been defined as “any of the features that make something what it is” and “the degree of excellence which a thing possesses”. The degree of quality is the consistency in which feed is formulated, processed, mixed and delivered as compared to what is expected. In India the quality control is regulated by a statutory body, Bureau of Indian Standards (BIS). It was established under BIS Act, 1986. Earlier, Indian Standards Institute was regulating the quality control of various commodities.

The objectives for the setup of BIS are as follows:

- Harmonious development of the activities for standardization of various feed commodities.
- Marking
- Quality certification of goods
- Attending to connected methods

Bureau has set up sub committees for the standardization of different types of commodities. A sub-committee on animal feeds called Animal Feeds Section Committee, specifically set up to check the quality of animal feeds and feed ingredients.

Development of Feed Industry in India

Feed industry came into existence in India in 1961 with the establishment of a feed plant in Ludhiana. Compound Livestock Feed Manufacturers Association (CLFMA) was then formed which is the sole, national representative body of compound animal feed manufacturers in India. It has about 115 members in the public, private and cooperative sectors with about 150 small, medium and large scale feed mill all over the country producing nearly 3 million tons of compound feed per annum.

Any good feed quality-control program contains four components:

- Ingredient quality
- Process control
- Finished feed quality, and
- Control of toxic substances, including pathogenic microorganisms.

Ingredient Quality

Many feed ingredients are by products from other industries and feed manufacturers often find it difficult to sort out ingredients and ingredients quality. Ingredients can account for 70-80% of the cost of producing feeds (Jones, 1989). Furthermore as feed mill gets larger, the percentage of total cost accounted for by ingredients will tend to rise. Quality has been defined by various individuals as “Fitness for use” or “meeting an expectation” or “Degree of excellence” or “Conforming to a standard”

The first priority in the production of quality feed is to understand and define ingredient quality in specific terms. This means that ingredients must be described in two ways. First, they must be described in terms of analytical values and

second, they must be described in terms of physical and/or sensory characteristics. The first depiction describes ingredients in terms that analytical chemists understand, while the second describes ingredients so that the unloading or mill personnel can make decision about ingredient quality.

Process Control

The process by which high-quality ingredients are made into high-quality feeds involves three components within the feed mill: personnel, machinery and procedures. If quality is lacking in any of these three components, the consistent production of high-quality feeds is unlikely.

Quality and process control

Once quality personnel, machines and procedures have been established, control can best be maintained by applying effort at the “quality pressure points” in the mill. These “pressure points” are:

- Ingredient inventories
- Bin cleaning
- Verification of equipment cleanliness and condition

- Grinding
- Batch system validation
- Mixing
- Pelleting and pellet cooling
- Meters and scales
- Truck inspection and cleaning

Finished Feed Quality

In many situations, feeds are used rapidly following manufacture and animals consume the feeds before any assays can be performed. However, finished-feed assays are necessary and important because they provide the mill with a “final report card” on how well quality was controlled.

How much finished-feed sampling and analysis should be done? While the answer to that question will depend on numerous factors, a general rule of thumb is to collect one sample of each formula per week or one sample per 100 tons of production, whichever is greater. When a problem is discovered, it should be addressed and resolved as soon as possible.

Table 1: Name of raw material according to the nutrient source

Carbohydrate	Protein	Fat	Calcium
Corn	Soybean meal	Rice bran fine	Lime stone coarse
Broken rice	Meat and bone meal	Rice bran coarse	Lime stone fine
Wheat	Rape seed meal	Soya boiled	Mono calcium phosphate
Rice bran fine	De-oiled rice bran	Palm fatty acid oil	Di-calcium phosphate
Rice bran coarse	Coconut meal	Rice bran oil	-
Paddy	Wheat	Wheat	-
Mushuri bran	Wheat bran coarse	Wheat bran coarse	-
Mustard meal	Fish meal	Coconut meal	-
Wheat bran coarse	De-oiled and dried grain solvent.	Mustard meal	-

Table 2: Density of different types of raw materials

Sl. No.	Raw material name	Density (Kg/ cubic meter)		Grinding net size (mm)
		Before grinding	After grinding	
1	Corn	761	780	8.0 x 8.0
2	Paddy	641	607	8.0 x 4.0
3	SBM	708	671	8.0 x 8.0
4	Broken rice	943	989	3.0 x 3.0
5	Mustard meal	791	757	3.0 x 3.0
6	Coconut meal	791	722	3.0 x 3.0
7	Wheat	790	673	3.0 x 3.0

Table 3 Quality control of feed ingredients

Ingredient Quality (Qualitative)	Physical characteristics (analyst's skills): Colour, texture, odour and taste, Particle size (screen analysis)' shape, evidence of wetting, adulteration, damage and deterioration, bulk density storage, pest, faecal material, hairs etc, spot chemical test.
Ingredient Quality (Quantitative)	<p>Chemical analysis: Moisture, CP, CF, EE, NFE, ash, Acid insoluble ash (silica or sand), salts, free fatty acids, biogenic amines, urea and NPN and amino acids.</p> <p>Anti-nutritional factors:</p> <p>Extrinsic (contaminants): Mycotoxins, weeds, insecticide, herbicides, fungicides.</p> <p>Intrinsic: Allergins, lectins, phytoestrogens, glucosinolates (rape seeds), saponins, tannins, ricin, sinapine, gossypol (cotton seed cake), lipoxygenase, trypsin inhibitor, urea.</p> <p>Decomposition and rancidity test: Acid value, peroxide value, etc.</p> <p>Protein quality: Protein solubility or dispersibility, Nitrogen solubility, Maillard reaction product, dye binding, pepsin digestibility, amino acid digestibility.</p>

Indian Standards of Poultry Feeds (Is: 1374; 1992)

Types of feeds: 6

Broiler starter feed, Finisher feed, chick feed, growing chicken feed, laying chicken feed, breeder laying feed.

Description: The feed shall be free from rancidity, musty odor, toxic ingredients, adulterants, moulds and insects infestations.

Packaging: The feed shall be packed in clean, dry and sound plain or polythene lined jute or laminated paper bags.

Aflatoxins: The aflatoxin content of poultry feed should not exceed 500 ppm.

Marking: Each bag should be suitably marked so as to give the all information of the feed: name, type, net mass, batch, manufacturing year and date etc.

Types of Chicken Feeds

- Broiler starter feed (BSF): An all mash ration to be fed

to chicks, intended for meat production, up to the age of four weeks.

- Broiler finisher feed (BFF): An all mash ration to be fed to chicks, intended for meat production, up to the age of six weeks.
- Chick feed (CF): An all mash ration to be fed to chicks, not intended for meat production, up to the age of eight weeks.
- Growing chicken feed (GCF): A ration to be fed to growing chicken from 8-20 weeks or until laying commences.
- Laying chicken feed (LCF): A ration to be fed to laying birds from 20 weeks onwards or after laying commences.
- Breeder layer feed (BCF): A ration to be fed to breeding chicken.

Table 4 BIS specifications for poultry feed

Characteristics	Broiler starter	Broiler finisher feed	Chick feed	Growing chicken feed	Laying chicken feed	Breeder layer feed
Moisture maximum %	11	11	11	11	11	11
Crude protein min %	23	20	20	16	18	18
Crude fibre max%	6	6	7	8	8	8
AIA max %	3	3	4	4	4	4
Salt max % as NaCl	0.6	0.6	0.6	0.6	0.6	0.6
Calcium min % (as Ca)	1.2	1.2	1	1	3	3
Available P min %	0.5	0.5	0.5	0.5	0.5	0.5
Vit A (IU/kg)	6000	6000	6000	6000	8000	8000
ME Min% (Kcal/Kg)	2800	2900	2600	2500	2600	2600

Specification for Pig Feeds**Types of Pig Feeds:**

- Pig starter/creep feed: Ration to be fed up to 15 Kg live mass when the litter is with sows.
- Pig growth meal: Ration to be fed from weaning up to 35 kg live mass.
- Pig finishing/breeding meal: Ration to be fed to pigs over 35 kg live mass.

Table 5 BIS specification for swine feed

Characteristics	Pig feed		
	Starter	Growth	Breeding
Moisture max %	11	11	11
Crude Protein min%	20	18	16
Crude fibre max %	5	6	8
A I A m a x %	4	4	4
Ether extract Min%	2.0	2.0	2.0
Vitamin A (IU/Kg)	1700	1300	1300
Calcium (g/Kg)	6	6	6
Phosphorus (g/Kg)	6	4	5

Improvement in the Quality of Feed

- Choosing the best quality raw materials available
- Fortifying the nutrient content of the diet with commercially available nutrients i.e. amino acids, mineral supplements, vitamins etc.
- Using additives to enhance the availability of the nutrients e.g. enzymes.

Conclusion:

Quality management is very much important in any feed

industry. Only quality raw material can deliver the quality output product. Different types of raw materials are received every day in a feed mill, such as corn, soybean meal, meat and bone meal, rice bran, limestone etc. to sort out the quality one, some rapid test and inspection methods are applied commonly, such as moisture, insect, smell, fungus, hull test, urease activity test, particle size test etc. All raw materials samples are sent to the feed mill laboratory to inspect by the quality control unit for sorting out quality raw materials. If the raw materials satisfy the necessary quality standard, would be entered to the production cycle.

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