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# NEWS LETTER

OIL TECHNOLOGISTS' ASSOCIATION OF INDIA  
WESTERN ZONE

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## *From the Editors's Desk*

***These are eventful days. We are still groping about the path we have to follow. Political conflicts are influencing the route to be followed. But we seem to be clear about our goal. We read to recognise our direction to suit demands. A glance at data on oilseed growth patterns in the issue will bring more ideas to became successful. A big boost to oils and fats will delight everyone. We need to act like task forces. Oil technologists have the Will and power. All glory to them.***



“EXCITING”

## Indian Pulses Sector Ready for Transformation

By: G. Chandrashekhar

DESPITE the fact that India is the world's largest producer, processor, importer and consumer of pulses, the country's pulses sector-from input supplies till retail consumption - is characterized by a long and inefficient chain that often pushes costs higher without corresponding economic benefits. The structural issues along the value chain have been ignored for long years. Transformation of the entire supply chain is the necessity of the times. Indian pulses sector deserves to be infused with efficiency so as to capture value at every stage and become globally competitive.

I would define global competitiveness as the ability to produce globally acceptable quality at globally comparable cost; and today, sadly, Indian pulses cannot be said to be globally competitive. The pulses sector in the country has suffered because of lack of policy support, research support and investment support for decades.

It is in search of a trigger to transform. The United Nations declared International Year of Pulses 2016 can well be the trigger. If there is any one country in the world that can demonstrate a 'quantum jump' in pulses production and /or consumption, it is India.

The country is uniquely placed to make an impacting difference to the global pulses sector by focusing on infusing efficiencies in the pulses value chain. For India Pulses and Grains Association (IPGA), the apex body for the country's pulses industry and trade, it is time to seize the opportunity.

I would think IPGA's overarching theme in the run up to IYoP 2016 ought to be: Expansion of

domestic production and consumption coupled with liberalization of trade and modernization of milling / processing industry to make Indian pulses sector globally competitive.

There are various stakeholder groups that have to be brought together. These include input suppliers (seed, fertilizers, agro-chemicals); growers (mostly small and marginal); processors (dal mills numbering 15,000 mostly with antiquated plant & machinery); importers and exporters (large and small trading houses); local traders; indenters; food processing companies; consumers (institutional and household); policymakers (Federal and States); research institutions as well as service providers (banks, surveyors, warehouses, laboratories, shipping companies, C & F agents, transporters and so on).

IPGA should set off a dialogue and work with the aforesaid stakeholders operating in different parts of the country to pursue the following objectives:

- To create awareness about IYoP 2016
- To initiate stakeholder consultation on way forward
- Ascertain broad contours of each stakeholder group's plans
- Dovetail the plans into a national agenda

IPGA has a certain moral responsibility to catalyze and facilitate the transformation. It must undertake a series of initiatives. For instance, as a priority, it must seek to create a Research-Industry Interface by liaising with leading research institutions (ICAR, ICRISAT, IIPR, TNAU); and provide forward guidance on market-need oriented research priorities.



Low yields are a bane of the pulses sector. Yield enhancement strategies have to be adopted for which requisite resources - financial, technological and human - have to be organised.

Another area that cries for attention is the processing industry. The milling capacity is highly fragmented and mills fail to capture scale economies. Work towards consolidation of fragmented capacities deserves high priority. Simultaneously, dal mill modernization brooks no delay. IPGA should work with policymakers to create a dal mill modernization fund. If the process of modernization is embarked upon in right earnest, there is scope for attracting foreign direct investment in the dal milling industry.

Food safety, hygiene and quality standards deserve attention. IPGA must act as facilitator to create awareness and educate stakeholders about compliance with food laws, especially Food Safety and Standards Act.

Consumer interest deserves to be advanced. IPGA must seek to address the scourge of malnutrition and under-nutrition (protein deficiency) especially among the poor. For the purpose it is imperative the association works with

policymakers to promote consumption of pulses through various public welfare programs.

Work with food technological research institutions as well as food processing companies to research utilisation of pulses to produce protein-rich, ready-to-eat, economically-priced snacks/foods for mass consumption will take the industry and utilisation of pulses to a higher level.

While pulses imports are liberal, exports are highly restricted. A restricted export policy works against growers' interest. Keeping both export and import open and free would make for a progressive foreign trade policy. Exports would improve the marketability of the crop, benefit growers, enhance capacity utilisation in the processing industry and earn foreign exchange.

Because South Asia is the world's largest import region and issues related to pulses production and trade are similar, it would be the country's interest to work closely with counterparts in Pakistan, Bangladesh and Sri Lanka. Transforming the pulses sector is without doubt a daunting challenge. IPGA - go ahead and seize the opportunity.

*(Courtesy : Grain Asia, November 2014)*

## “GOOD NEWS”

### Food prices show sign of stabilization

FOOD prices were seen stable in October, as sugar and vegetable oil prices rose to offset declines in dairy and other food product prices, reveal FAO Food Price Index. According to FAO, Food Price Index dipped to 192.3, technically, its seventh consecutive monthly decline, but a marginal 0.2 percent drop from the revised September figure. The ongoing slight decline in the index is "very good for food importing countries," FAO senior economist Concepcion Calpe said in an interview. The shifts come as FAO raised its forecast for a record global wheat output this growing season.

In the dairy segment, prices fell by 1.9 percent, as butter and milk powder prices dipped due to increased output in Europe, where many producers are grappling with Russia's ban on cheese imports. The sub-index for dairy products

dropped to 184.3, down 3.5 points from September, and 66.8 points, or 26.6 percent down from October 2013.

The Cereal Price Index, which fell sharply over the recent months as global wheat and maize production appeared set for record harvests, was broadly stable at 178.4 points in October as maize harvest delays in the United States and deteriorating prospects for Australia's wheat crop led to firmer prices. Rice prices declined, however, as newly harvested supplies came to market. The cereals sub-index is now down 9.3 percent, or 18.2 points below the level one year ago. Overall, the Food Price Index is at its lowest levels since August 2010.

Notably, FAO's Food Price Index is a trade-weighted index that consists of the average of five

commodity group price indices - cereals, meat, dairy products, vegetable oils, and sugar. The Sugar Price Index rose to 237.6 points, a brisk 4.2 percent increase from the previous month, due largely to drought in parts of Brazil, leading to reports that the sugarcane crop will be smaller than expected. Despite the month's gains, international sugar prices remain more than 10 percent below their October 2013 level.

The vegetable oils sub-index rose for the first time since March, clocking in at 163.7 points in October, up 1.0 percent, or 1.6 points from September. Palm oil production slowdowns in Indonesia and Malaysia, combined with a revival in global import demand, sustained the increase. Soy oil prices weakened due to robust North American harvest prospects, while sunflower seed oil quotations rose due to smaller than expected harvests in the Black Sea region. The oils index is down 12.9 percent from October 2013.

Coming to the grain output forecast, global wheat production has been raised, as output from Ukraine is on track to be higher than previously expected. This growing season's wheat crop is now expected to top last year's record harvest with a total output of 722.6 million tonnes.

*(Courtesy : Grain Asia, November 2014)*

## "HURRAH"

**Wheat breeder Dr. Rajaram awarded  
World Food Prize**

WHEAT breeder Dr Sanjaya Rajaram, who has spent his life developing more than 480 varieties of the staple crop, bagged the 2014 World Food Prize at the Iowa State Capitol in Des Moines.

As the World Food Prize culminates in the centennial year of its founder (and Dr Rajaram's mentor, Dr Norman Borlaug), as well as the United Nations' (UN) Food and Agriculture Organisation's (FAO) International Year of Family Farming, it is especially fitting that we recognise the impact of Dr Rajaram's achievements.

"Dr Rajaram worked closely with Dr Borlaug, succeeding him as head of the wheat breeding programme at the International Maize and Wheat Improvement Centre (CIMMYT) in Mexico," said Kenneth M Quinn, president, World Food Prize.

"He then carried forward and expanded upon his work, breaking new ground with his own invaluable achievements. His breakthrough breeding technologies have had a far-reaching and significant impact in providing more food around the globe and alleviating world hunger," he added.

"Dr Borlaug himself called Dr Rajaram the greatest present-day wheat scientist in the world and a scientist of great vision. It is an honour to recognise the latter for his development of 480 varieties of wheat, bred to offer higher yields, resistance to the catastrophic rust disease, and that thrive in a wide array of climates," Quinn stated.

Born in a small village in India, Dr Rajaram worked to be the top in his class as he moved through school, and dedicated his life to making direct improvements for farmers and all people who depend on agriculture. Now a citizen of Mexico, he conducted the majority of his research at the CIMMYT in his adopted nation.

Dr Rajaram's work there led to an increase in world wheat production by more than 200 million tonnes during the 25-year-period, known as the golden years of wheat, building upon the successes of the Green Revolution.

The wheat varieties developed by him have been released in 51 countries on six continents, and have been widely adopted by small- and large-scale farmers alike.

Dr Rajaram's cross-breeding of winter and spring wheat varieties, which were distinct gene pools that had been isolated from one another for hundreds of years, led to his development of plants that have higher yields and dependability under a wide range of environments around the world.

*(Courtesy : Grain Asia, November 2014)*

## “GET SET”

### India's edible oil demand seen rising

INDIA'S demand for edible oils has been rising consistently at a compounded annual growth rate of 2.7 percent in the last 3 years and around 5.5 percent in the last 5 years. Usually, India imports about 60 percent of its edible oil demand of 17-18 million tonnes.

According to Solvent Extractors Association data, vegetable oil imports in September increased 21 % to 1.05 million tonnes (mt) from the year-ago period, after hitting a record at 1.3 mt in August. Of total 1.05 mt of vegetable oils imported in September, edible oils made up 1.02 mt and non-edible oils shipments were 28,853 tonnes against 0.83 mt and 30,062 lakh tonnes in the same period a year ago.

Vegetable oil imports are turning cheaper following the efforts of Indonesia and Malaysia two of the world's top palm oil producers to clear their inventories. To curb cheap imports and protect local oilseeds farmers, industry associations have been demanding a rise in the import duty of crude and refined edible oils from current levels. The

SEA has been demanding a duty hike in crude vegetable oils to 10 % from 2.5 % and in refined vegetable oils to 25% from 10%.

However, India depends largely on the imports of edible oil. Due to insufficient production of oilseeds, it imports a significant portion. Oilseeds productivity is still low compared to other producing countries. According to IBA, the main reason for low productivity is drop in oilseeds acreage on account of switch over by farmers to other profitable crops and dependence on rainfall rather than irrigation.

Soyameal, derived from soyabean is currently not competitive in the export market leading to lower crushing of beans and increasing dependence on imports. In case of palm, zero export duty from Malaysia and Indonesia is leading to fears that more imports are on cards. Hence, domestic consumption is expected to continue driving demand for imported edible oil.

*(Courtesy : Grain Asia, November 2014)*



## Amul

products will be soon seen in US markets



AMERICANS and the Indian diaspora there will finally get the 'Taste of India'. Kaira District Co-operative Milk Producers Union popularly known as Amul Dairy has started production of three dairy products at its US plant located at Waterloo village in upstate New York. The plant, located 350 miles away from New Jersey, is home-grown Amul's first manufacturing facility outside India. The facility has been set up under a tripartite agreement between Amul Dairy, the Gujarat Co-opera-

## “Hello ! Obama”

Amul products will be soon seen in US markets

tive Milk Marketing Federation (GCMMF) that markets brand Amul and New Jersey based NRI businessman Piyush Patel. The facility spread over three acres set up by Patel with an investment of \$9 million has initial capacity of manufacturing 50 tonnes of shrikhand, 100 tonnes of paneer and 200 tonnes of ghee per month. Recently, Amul Dairy celebrated its 69th Foundation Day and 140th birth anniversary of Sardar Patel whose vision had led to the establishment of Amul Dairy in 1946.

*(Courtesy : Business Star, November 2014).*



## “AMAZING”

### Horticulture production exceeds food grains production

IN 2012-13, national horticulture production (at over 268 million tonnes or MT) for the first time exceeded food grains (262 MT) production. This positive development is expected to help change the economic scenario for farmers taking up horticulture. Indian Council of Agricultural Research (ICAR) is now consciously promoting horticulture, including promoting more investment. N Krishna Kumar, deputy director general of horticulture, refuted the general perception that horticulture crops require a lot of irrigation, saying crops like grapes, pomegranate and citrus can be managed well with protective irrigation and right cultivation practices. A farmer could earn as much as Rs 6-7 lakh per hectare in grapes and as much as Rs 15 lakh in pomegranate, by improving soil health using micro-irrigation and fertigation techniques. High Density Plantation (HOP) is also being projected as a better option in mango, guava and citrus. Kumar, however, clarified that various regions need different packages of practices and technology for citrus. Income from horticulture could also be increased by improving transportation, especially long distance transport, adding cold storage facilities and targeting demand for organic produce.

*(Courtesy : Business Star, November 2014).*

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### Soyabean output pegged at 10.4 Mt

THE Soyabean Oil Processors Association (SOPA) has pegged domestic soyabean output to increase by about a 10 percent over last year to around 10.4 million tons this year. The increase in output is higher on account of rise in yields per hectare this kharif. The latest crop estimate by the industry would still be lower than projections made by the Agriculture Ministry at 11.98 million tons (mt). The crop survey conducted by SOPA recently in Madhya Pradesh, Maharashtra and Rajasthan pegs the all-India

yields for kharif 2014 at 959 kg/hectare against 788 kg/hectare last year.

In Madhya Pradesh, SOPA has projected an output of 60.24 lakh tons (lt), an increase of 39.26% over last year of 42.26 lt.



In Maharashtra, the acreage is marginally lower at 38 lh compared to 38.70 lh last kharif while the output is estimated at 30.72 lt this kharif, lower than previous year of 38 lt. In Rajasthan, Output pegged at 5.63 lt (7 lt).

*(Courtesy : Grain Asia, November 2014)*

## “MORE ACTION”

### Action Plan for Oilseed Productivity & Opportunity in North East

LAST week I, along with Dr. B.V. Mehta, E.D. had a meeting with Mr. Sanjay Lohiya, Joint Secretary, in the Ministry of Agriculture to discuss the Action Plan submitted by the Association for raising the production and productivity of oilseeds in the country. He has shown keen interest in implementing various suggestions made by us in action plan for raising the oilseed productivity. Ministry of Agriculture has various oilseeds development programme under National Mission on Oilseeds and Oil Palm (NMOOP). He suggested to associate with the Government's programme for augmenting oilseed production in the country.

He also pointed out that special programme and fund available for project in North Eastern states having good scope for the development of oil palm plantation, apart from setting up oilseed crushing units particularly for » rape/mustard. Ministry of Agriculture is ready to organize a visit of few industrialist interested to set up the oilseed crushing and oil palm plantations in North East States sometime during January 2015. Members interested to join for the visit are requested to contact the Association.

*(Courtesy : SEA NEWS CIRCULAR, December 2014).*



## “CHAIN COMMAND”

### India needs well managed supply chain and cold chain system

AGRICULTURE is one of the major occupations in India and the country is the largest producers of agricultural products in the world. Regardless of the fact that India is a worldwide leader of agricultural products, it has a huge need for modern post-harvest storage network, deficiency of which causes large losses both in quantitative and value terms. Almost \$8 to \$15 billion losses have been estimated per annum from the agricultural sector alone.

Cold chains and ambient temperature warehouses play a vital role in the food industry for the maintenance of the quality of produce and in value enhancement. It is also essential for extending the shelf life, period marketing, avoiding over capacity and reducing transport bottleneck during peak period of production. The development of cold chain industry has an important role to play in reducing the wastage of the perishable commodities and thus providing remunerative prices to the

growers. It can as a backbone to all interested players - the farmer, the trader and the agriculture industry and helps to maintain the freshness of the products by providing temperature-controlled environment. With growth in domestic manufacturing and retail segments, the demand for efficient warehouse management service has improved and this is only the start. Over the last 10 years, some investment has moved in the warehousing and cold storage space, however, much more is needed.

A very large role is played by the government, being the largest user and also owner of capacity, through the CWC (Central Warehousing Corporation) and SWC (State Warehousing Corporations) and it is for them to make the sector attractive, the warehouse rental rates need to be attractive. Developing an integrated supply chain, including cold chain, can save up to 300 billion kg or Rs annually, and at the same time, reducing



the wastage of perishable horticulture produce. It is worth noting that the price of vegetables, fruit, milk and eggs, meat and fish have been rising faster in spite of the fact that India is the second highest producer of fruit and vegetables. This is caused by inadequate supply chain and logistics infrastructure and management.

In the last three years, India's integrated cold chain industry has grown at a compound annual growth rate (CAGR) of 20 percent for the last three years and it is a combination of surface storage and refrigerated transport. The cold chain market in India is anticipated to reach 624 billion by 2017. There are approximately 6,300 cold storages in India designed originally for single commodity storage - potatoes, though we have seen them being used for carrots, tamarind, pulses, chickpea, and so on. Refrigerated transport or cold chain distribution is still in its nascent stage in India and is way behind if compared to world standards for cargo movement. Various industries covered under cold chain are agriculture, horticulture and floriculture, dairy, confectionery, pharmaceuticals, chemicals, and poultry.

India is among the foremost countries in horticulture production, just behind China. However, despite the rise, India is way behind its nearest rival in per-hectare yield and processing of horticulture products. It stores only two per cent of its horticulture products in temperature-controlled conditions, while China stores 15 per cent and Europe and North America store 85 per cent of their products in such conditions. Another important factor that touches the agriculture industry of India is the supply chain. Supply chains are principally concerned with the flow of products and information between supply chain member organisations — procurement of materials, transformation of materials into finished products, and distribution of those products to end customers. Today's information-driven, integrated supply chains are enabling organisations to reduce inventory and costs, add product value, extend resources, accelerate time to market, and retain customers.

*(Courtesy : Business Star, November 2014).*

## "HURRAY"

### Union Govt. pushes for low-interest loans to food processing units

THE Union Government has set up a Rs.2,000-crore corpus for Nabard to help lend to food processing units at a "lower interest rate".

According to Harsimrat Kaur Badal, Union Minister for Food Processing Industries, loans would be provided to units located both inside and outside mega-food parks.

According to sources, Nabard under the new scheme is supposed to provide loans for an expected seven year period with a "lower interest rate".

The fund will be provided to large food chains and units and also for creation of infrastructure in these parks.

Badal, however, reiterated the need to amend or abolish the State Agri-Produce Market Committee Act. The need of the hour was value-addition to agri-produce, thereby ensuring uplift in farmer conditions. Contract farming too could be explored as an alternative solution, the minister said, "The APMC Act has to be abolished."

She added, "Our idea is to see that each farmer family works as a self-help group with family members looking after the food-processing and sale of final product segments." (Source: Business Line, dt. Nov 10, 2014).

*(Courtesy : SEA NEWS CIRCULAR, December 2014).*

**52nd ALL INDIA CONVENTION ON  
KHARIF OILSEEDS, OILTRADE & INDUSTRY  
ON  
14th DECEMBER, 2014 AT NEW DELHI**

**COOIT'S ESTIMATES OF  
PRODUCTION AND MARKETABLE SURPLUS OF  
KHARIF OILSEEDS AND AVAILABILITY OF VEGETABLE OILS  
DURING OIL YEAR 2014-15**

**1. GROUNDNUT**

(IN LAKH TONNES)

Sr. No.	State	Trade Estimate			2013-14 Season		
		2014-15 Season		Total	Kharif	Rabi	Total
		Kharif	Rabi*	Total	Kharif	Rabi	Total
1.	Gujarat	14.40		25.00	25.00	2.86	27.86
2.	Maharashtra	1.60		1.75	1.75	1.12	2.87
3.	Andhra Pradesh	3.80		6.00	6.00	4.35	10.35
4.	Tamil Nadu	2.00		1.80	1.80	3.44	5.24
5.	Karnataka	3.10		3.50	3.50	3.46	6.96
6.	MadhyaPradesh/C.G.	2.00		1.70	1.70	-	1.70
7.	Rajasthan	6.50		5.20	5.20	-	5.20
8.	Punjab/Haryana/U.P	0.80		0.80	0.80	--	0.80
9.	Orissa	1.00		1.00	1.00	1.99	2.99
10.	Others	0.50		0.40	0.40	0.45	0.85
	Total in Shells	35.70		47.15	47.15	17.67	64.82
	Equivalent in Kernals (70%)	25.00		33.00	33.00	12.37	45.37
	Retained for sowing	5.00		5.40	5.40	1.20	6.60
	Export	5.00		5.00	5.00	1.50	6.50
	Direct consumption	12.00		12.00	12.00	4.40	16.40
	<b>Sub Total</b>	<b>22.00</b>		<b>22.40</b>	<b>22.40</b>	<b>7.10</b>	<b>29.50</b>
	Marketable Surplus (In kernels for crushing)	3.00		10.60	10.60	5.27	15.87

\* Rabi crop will be harvested in Feb/March 2015



## 2. SOYBEAN

Sr. No.	State	Trade Estimate			2013-14 Season		
		2014-15	Season		Kharif	Rabi	Total
		Kharif	Rabi*	Total	Kharif	Rabi	Total
1.	Madhya Pradesh	53.00	—	53.00	43.30	—	43.30
2.	Maharashtra	25.00	—	25.00	38.00	—	38.00
3.	A.P./Telangana	2.50	—	2.50	2.30	—	2.30
4.	Rajasthan	6.00	—	6.00	7.00	—	7.00
5.	Karnataka	2.60	—	2.60	2.00	—	2.00
6.	Chhatisgarh	1.30	—	1.30	0.90	—	0.90
7.	Gujarat	0.70	—	0.70	0.80	—	0.80
8.	Others	0.60	—	0.60	0.70	—	0.70
	Total	91.70	—	91.70	95.00	—	95.00
	Retained for sowing	10.00	—	10.00	9.00	—	9.00
	direct consumption						
	& Export	5.00	—	5.00	3.50	—	3.50
	Sub Total	15.00	—	15.00	12.50	—	12.50
	Marketable surplus						
	for crushing	76.70	-	76.70	82.50	--	82.50

(R) Revised

### 3. RAPE/MUSTARD/TORIA

Sr. No.	State	Trade Estimate			2013-14 Season		
		2014-15	Season		Kharif	Rabi	Total
		Kharif	Rabi*	Total	Kharif	Rabi	Total
A)							
1.	RAPE/MUSTARD						
	Uttar Pradesh	0.50		1.00	9.00	10.00	
2.	Rajasthan	—		—	34.65	34.65@	
3.	Punjab/Haryana	0.20		0.40	8.00	8.40	
4.	Gujarat	—		—	4.80	4.80	
5.	Madhya Pradesh	—		—	6.00	6.00	
6.	Chhattisgarh	—		—	1.00	1.00	
7.	West Bengal	—		—	2.80	2.80	
8.	Bihar	—		—	1.50	1.50	
9.	Eastern India &						
	Others	0.10		0.10	4.50	4.60	
	Total	0.80		1.50	72.25	73.75	
	Retained for sowing &						
	direct consumption	—		—	2.50	2.50	
	Marketable Surplus	0.80		1.50	69.75	71.25	

\* Rabi crop will be harvested in Feb/March 2015

@ Includes 1 .25 lakh tons of Taramira Crop

#### 4. SUNFLOWERSEED

Sr. No.	State	Trade Estimate			2013-14 Season		
		2014-15	Season		Kharif	Rabi	Total
		Kharif	Rabi*	Total	Kharif	Rabi	Total
1.	Karnataka	0.90		1.50	2.30	3.80	
2.	Andhra Pradesh	0.10		0.10	0.80	0.90	
3.	Maharashtra	0.20		0.20	0.35	0.55	
4.	Tamilnadu	—		0.05	—	0.05	
5.	Punjab	0.10		—	—	—	
6.	Haryana	—		—	—	—	
7.	Uttar Pradesh	—		—	—	—	
8.	Bihar	—		—	—	—	
9.	Others	—		—	0.50	0.50	
	Total	1.30		1.85	3.95	5.80	
	Retained for sowing						
	direct consumption						
	& export	—		—	—	—	
	Marketable surplus						
	forcrushing	1.30		1.85	3.95	5.80	



## 5. SESAMESEED

Sr. No.	State	Trade Estimate 2014-15 Season			2013-14 Season		
		Kharif	Rabi*	Total	Kharif	Rabi	Total
1.	Gujarat	0.45			0.20	0.55	0.75
2.	Rajasthan	1.30			0.60	—	0.60
3.	Tamil Nadu	0.05			0.05	0.25	0.30
4.	Madhya Pradesh/C G.	1.30			0.60	—	0.60
5.	A. P. /Telangana	0.08			0.10	0.17	0.27
6.	Maharashtra	0.06			0.05	—	0.05
7.	Karnataka	0.11			0.10	—	0.10
8.	U.P./Uttanchal	0.85			1.20	—	1.20
9.	West Bengal	—			—	1.60	1.60
10.	Orissa	0.35			0.40	0.45	0.85
11.	Others	0.15			0.20	—	0.20
	Total	4.70			3.50	3.02	6.52
	Retained for sowing, direct consumption & export	4.70			3.50	3.02	6.52
	Marketable surplus	3.00			3.00	1.00	4.00
	for crushing	1.70			0.50	2.02	2.52

\* Rabi crop will be harvested in Feb/March 2015.

## 6. CASTORSEED

Sr. No.	State	Trade Estimate 2014-15 Season			2013-14 Season		
		Kharif	Rabi*	Total	Kharif	Rabi	Total
1.	Gujarat	—	—	8.40	—	—	8.40
2.	Rajasthan	—	—	1.60	—	—	1.60
3.	Andhra Pradesh	—	—	1.00	—	—	1.00
4.	Maharashtra & Others	—	—	0.30	—	—	0.30
	Total Retained for sowing & export	11.00	—	11.30	—	—	11.30
	Marketable surplus forcrushing	11.00	—	11.30	—	—	11.30

@ Provisional.

To be revised at Global Castor Conference to be held on 21.2.2015

## 7. NIGERSEED

Sr. No.	State	Trade Estimate 2014-15 Season			2013-14 Season		
		Kharif	Rabi*	Total	Kharif	Rabi	Total
1.	Orissa	0.20	—	0.20	0.20	—	0.20
2.	M. P. & Chhatisqarh	0.20	—	0.20	0.20	—	0.20
3.	Others	0.30	—	0.30	0.30	—	0.30
	Total	0.70	—	0.70	0.70	—	0.70
	Retained for sowing, direct consumption & export	0.35	—	0.70	0.35	0.70	0.25
	Marketable surplus forcrushing	0.35	—	0.35	0.45	—	0.45

## 8. SAFFLOWERSEED (KARDI)

Sr. No.	State	Trade Estimate 2014-15 Season			2013-14 Season		
		Kharif	Rabi*	Total	Kharif	Rabi	Total
1.	Maharashtra	—			—	0.55	0.55
2.	Karnataka				—	0.27	0.27
3.	Andhra Pradesh	—			—	0.06	0.06
4.	Others	—			—	0.13	0.13
	Total						
	Retained for sowing & direct consumption	—			—	1.01	1.01
	Marketable surplus forcrushing	—			—	0.10	0.10
						0.91	0.91

\* Rabi crop will be harvested in Feb/March 2015

## 9. LINSEED

Sr. No.	State	Trade Estimate 2014-15 Season			2013-14 Season		
		Kharif	Rabi*	Total	Kharif	Rabi	Total
1.	Madhya Pradesh/C.G.	—			0.38	0.38	
2.	Uttar Pradesh				0.10	0.10	
3.	Maharashtra				0.12	0.12	
4.	Bihar				—		
5.	Nagaland				0.60	0.60	
6.	Others				—		
	Total						
	Retained for sowing & direct consumption	—			1.20	1.20	
	Marketable surplus forcrushing	—			1.20	1.20	

\* Rabi crop will be harvested in Feb/March 2015



**TOTAL ESTIMATED PRODUCTION OF NINE MAJOR OILSEEDS**

	<b>2014-15 Season</b>	<b>2013-14 Season</b>	<b>Change</b>
<b>Kharif</b>	<b>145.90</b>	<b>161.00(R)</b>	
Rabi *		99.10	
<b>Total</b>		<b>260.10</b>	

(R) Revised\*

Rabi crop will be harvested in Feb/March 2014

**COTTONSEED**

	<b>2014-15 Season</b>	<b>2013-14 Season (R)</b>
Bales of Cotton (170 Kg. each)	400.00 Lakh Bales	405.00 Lakh Bales
Cottonseed Production @ 310 Kg/Bale	124.00 Lakh Bales	125.50 Lakh Tonnes
Retained for Sowing & Direct Consumption	6.00 Lakh Tonnes	6.00 Lakh Tonnes
Marketable Surplus	118.00 Lakh Tonnes	119.50 Lakh Tonnes
Production of Washed Cottonseed Oil (12.0%)	14.16 Lakh Tonnes	14.34 Lakh Tonnes

(R) Revised

**COPRA (Milling)**

	<b>2014-15 Season</b>	<b>2013-14 Season</b>
Estimated Production	6.50 Lakh Tonnes	7.00 Lakh Tonnes
Equivalent Coconut Oil (65%)	4.25 Lakh Tonnes	4.55 Lakh Tonnes

**SOLVENT EXTRACTED OILS**

<b>S. E. Oils</b>	<b>Estimated for Oil Year 2014-15</b>			<b>Estimated for Oil Year 2013-14</b>		
	Edible	Non-Edible	Total	Edible	Non-Edible	Total
Rice Bran Oil	9.00	0.30	9.30	9.00	0.30	9.30
S.E. Rapeseed	1.70			1.60		
S.E. Sunflowerseed	0.40			0.40		
S.E. Groundnut	0.30			0.40		
S.E. Cottonseed & Others Oils	0.50			0.40		
Minor Oils (TBOs)	0.50			0.50		
Maize Oil	1.00			0.50		
Local Palm Oil	1.70			1.10		
<b>Total</b>	<b>15.40</b>			<b>14.20</b>		

**IMPORTED OIL**

Oils	Forecast for Oil Year 2014-15 (Nov-Oct)	Oil Year 2013-14 Estimate (Nov.- Oct)
Edible Oil	125.00	116.00
Vanaspati	-	-
Non- Edible Oil	2.00	2.00
<b>Total</b>	<b>127.00</b>	<b>118.00</b>

**State-wise Area of Oilseeds during 2011 -12 to 2014-1 5**

(000 Hectares)

State / UT	Oilseeds			
	2011-12	2012-13	2013-14*	2014-15§
Andhra Pradesh	1945.0	1945.0	1966.0	848.0
Arunachal Pradesh	32.5	32.3	#	#
Assam	268.3	306.2	284.0	21.0
Bihar	133.4	128.0	129.4	5.9
Chhattisgarh	308.3	297.5	289.7	211.4
Goa	3.2	3.1	#	#
Gujarat	3131.0	2452.0	3078.0	2240.0
Haryana	553.0	580.2	551.2	20.0
Himachal Pradesh	14.9	13.5	16.2	3.7
Jammu & Kashmir	64.8	64.8	65.2	4.9
Jharkhand	228.9	250.6	269.7	34.9
Karnataka	1416.0	1422.0	1507.0	857.0
Kerala	1.9	1.0	0.9	0.4
Madhya Pradesh	7201.6	7534.4	7828.0	6212.4
Maharashtra	3667.0	3806.0	4454.0	3914.0
Manipur	35.9	44.1	#	#
Meghalaya	9.9	10.0	#	#
Mizoram	2.5	2.1	#	#
Nagaland	64.0	64.5	#	#
Odisha	250.7	243.3	221.6	140.6
Punjab	50.0	51.4	49.4	19.0
Rajasthan	4622.7	4912.2	5279.8	1802.9
Sikkim	9.3	8.2	#	#
Tamil Nadu	449.2	388.5	421.8	220.9
Telengana	-	-	-	252.0
Tripura	4.7	4.8	#	#
Uttar Pradesh	1129.0	1147.0	1107.0	472.0
Uttarakhand	30.0	32.2	32.0	18.0
West Bengal	676.1	732.1	786.7	225.9
D&N Haveli	0.2	0.1	#	#
Delhi	4.0	6.8	#	#
A&N Islands	NG	NG	NG	NG
Pondicherry	0.4	0.4	#	#
Others	MA	NA	187.7	59.9
<b>All India</b>	<b>26308.2</b>	<b>26484.4</b>	<b>28525.3</b>	<b>17674.6</b>

\* 4th advance estimates; § 1st advance estimates (kharif only); # included in others; N G Not Grown; NA not Applicable. (Courtesy : SEA NEWS CIRCULAR, VOL XVII, ISSUE 9, DEC., 2014)

## “CLEANLINESS IS GODLINESS”

### 'Swachh Bharat Abhiyan' or 'Clean India Movement' through the Grassroots Development Models!

DURING the 67<sup>th</sup> Independence Day speech, Prime Minister Shri Narendra Modi gave a clarion call initiating the much needed cleanliness drive to improve the overall health and hygiene of our nation. He emphasised the imperatives of cleanliness, calling the movement, 'Swachh Bharat Abhiyan' or 'Clean India Movement'! He targeted its completion in a mission mode by the year 2019, when the nation would commemorate the 150<sup>th</sup> birthday of the father of our nation.

Besides common citizens, the P.M. had invited several leaders, celebrities and noted individuals to steer the 'Clean India Movement'. While it has evoked largescale interest amongst the general public, some sections of the society however, have cast doubt on the success of such a mammoth national project, that too within a short span of 5 years. Such scepticism is manifested out of previous failures of similar slogan oriented social programmes, launched by successive governments since independence.

For instance, programmes like the central rural sanitation programme 1986-99; the TSC (total sanitation campaign) 1999-2012 and the NBA (Nirmal Bharat Abhiyan) 2012-22 have failed in creating expected measurable impacts.

The biggest challenge in propagating the cleanliness drive exists in rural India. The basic sanitation cum hygienic requirements are, in general, missing in rural societies. According to a report, India leads the world in open defecation. Around 600 million people defecate daily in the open. Close to 300 million women, young girls and children defecate in open facing vagaries of weather and health problems and often encountering sexual harassments related crimes.

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\* The author is Advisor to the Dairy Food Sector and was formerly President, IDA; Executive Director, NDDB & Chairman Milk Panel, Vision 2020, TIFAC.

Corruption has been an important deterrent in any social sector development work, especially in the rural sector. According to the previous rural development ministry report, 68% of rural households have built toilets by providing subsidised government funds to each family. The census 2011 however reported that 60 million toilets stated to have constructed were not even present on the ground; four fifth of the project funds earmarked for the programme were siphoned off!

As compared to rural, the urban societies do have toilets, drainage and piped water supply facilities. Nonetheless, despite available infrastructure in the urban society, the existing age old municipal systems have primarily remained ineffective. The municipal governance is, in general, riddled with usual political interference and corruption. In addition, the citizen's casual attitudes towards cleanliness of their own shelters also hamper the overall up-keep of the urban locality.

The ever-increasing migrants from villages in search of livelihoods in cities lack access to proper shelters, toilets and sanitation facilities leading to increasing cleanliness challenges in urban societies.

These facts amply demonstrate that existing municipal delivery models and funds to be spent for maintaining cleanliness, hygiene and health need to be carefully handled. Thus, a resurrection of the existing municipal delivery system is, no doubt, indispensable.

Social behavioural change plays a central role in creating cleanliness, health and hygiene awareness in a society. Aggressive and unabated live demonstrations cum media propaganda should be the call for making any measurable impact in these areas. Hence, it would be desirable to implement the 'Clean India' program with equal priorities both at the urban and rural societies. Accordingly, a bottom-up grassroots development model should be the need of the hour.



Since the project is time bound, instead of delving into a new model, it would be advisable to re-use or resurrect any of the existing grassroots development models, as under:

There are several existing NGOs (non-government organisations) and SHGs (self-help groups) who have been successfully operating on various forms of social development activities both in the villages and cities.

Former President of India and Chairman TIFAC, revered Dr. Kalam had conceptualised a grassroots development model, naming it PURA (Provision of Urban Amenities to Rural Areas). According to him, any vision of prosperity should take into account the rural areas where majority (around 70 per cent) of the population live who should be provided with better accessibility for increasing non-farm income as well.

CSR (Corporate Social Responsibility) came into existence to make a significant difference in society and improve the overall quality of life by corporate India. Certain class of profitable companies are required to shell out at least two per cent of their three-year average annual net profit towards CSR activities. Efforts are being made to bring the socio-economic development of India on fast track. CSR is contemplated to have an effective and lasting solution to the social woes by mobilising expertise, strategic thinking, manpower in partnership with NGOs, Corporate and the government (wherever its participation is needed).

The father of White Revolution in India, late Dr. Verghese Kurien had evolved a bottom-up development programme in India globally known as 'Anand Model'. It is a three tier vertically integrated programme. In the past four decades this model has successfully spread throughout the length and breadth of our country and is also attempted in other developing cum emerging countries.

Since open defecating is the most critical issue affecting cleanliness drive at the village levels, establishing toilets should be our top priority. As mentioned above, government programmes for providing direct fund subsidy to establish toilets in rural India did not prove worthwhile. Evidently, instead of building toilets for individual

households, it would initially be desirable to create modern community toilets provided with inbuilt pipe water cum drainage facilities, in every village.

The 'Swachh Bharat Abhiyan' or 'Clean India Movement' would only be a real success, when cleanliness, health and hygiene facilities are accessible to all citizens, be they rich or poor, rural or urban. There are many ways that society can be conditioned to accept what has not been a norm, primary among them are behavioural changes that drive the change by first creating education leading to awareness, which drives self-realization, leading to acceptance and finally wilful compliance. So how can a model that brought dairy farmers together to set up one of the largest cooperative movements in the world help us to address the issue of sanitation and cleanliness?

#### **Let us explore the possibility.**

The objectives of Swachh Bharat as set forth by the Ministry of Urban Development can be classified into three buckets. First relates to waste management and related practices (converting insanitary toilets to pour flush toilets, no manual scavenging, 100% collection and scientific disposal), the second relates to structural issues (strengthening of local bodies to design, execute and operate systems and enable private sector participation) and the final relates to behavioural change (eliminate open defecation, building awareness and behavioural change in regards to sanitation).

Consider then the suitability of the Anand model to address these needs. The relevance of the first and the second buckets is apparent. The Anand model was instrumental in modernizing the dairy processing industry in the country and created the market as well as the industry to satisfy it thus laying the foundation for an increased participation from the private sector.

It is my opinion that we can learn from the same model to ensure that our waste management practices are modern and scientific and the waste can then be processed for further use in multiple applications. A modern waste management industry will remove the stigma associated with the waste collection process and in turn assist in

eradication of stigma that is associated with scavenging and scavengers. Global waste management is moving towards a zero waste and there is a strong interest in converting waste to energy with many private equity companies investing in the area. The cooperative approach could potentially create micro-energy plants through the bio-waste and drive other aspects of social change, especially in rural areas.

The final objective — that of behavioural change — is best brought about with participation from the rank and file of the entire ecosystem. As more people see their neighbours and relatives associate with cleaner and more hygienic practices, they too will embrace them and make it a regular practice.

In the spirit of a 'cooperative' movement I would encourage the model to consider building community toilets in the rural and urban areas, and incentivise the local community to take ownership of their upkeep.

The Central toilets would in the short and medium term reduce the cost of establishing a network of sewage pipes across the village and mini-

mizes collection efforts. The modern community toilets once established would not only make the whole community aware of the necessities of cleanliness, hygiene and health but also encourage people to abstain from open defecating.

The entire awareness campaign can be managed along similar lines through the extension workers, as being the spearhead team members, in the dairy cooperative movement. Once established in this manner, it will be easier to demonstrate to the communities the importance of a model toilet as a proper place for defecating and also the impact it has on health and hygiene. It might even be pertinent to actively seek guidance from NDDDB to better understand how this can be rolled out effectively.

The single biggest learning from the Anand model is that empowering local communities and creating an incentive for them to work together to drive a long lasting social change. I am therefore confident that similar model can be used to ensure success of the Swachh Bharat initiative. It is bad to fail, but worse not to try for success!

(Courtesy : Indian Dairyman, January 2015).

## **“NOVEL INDEED”**

### **Make in India:**

### **A novel national program**

MAKE in India slogan given by PM Narendra Modi from Red Fort on 15 August has caught the imagination of nation as well as of the world like never before. Make in India slogan should rather be made synonymous with make India as the manufacturing sector has the potential of making India an economic super power.

Manufacturing has long been a neglected sector but now the govt has realised that any country particularly as large as India cannot progress without a strong manufacturing sector. More than 10 million people in India join the work force every year, to create job for them and increase the per capital income, India has to have a self reliant manufacturing sector. Analysts believe reviving the manufacturing is a good bet because despite stag-

nant growth for the past many years, it accounts for a large chunk of jobs. Contrast that to farming, which employs about 50 percent of population, but contributes just around 14 percent of GDP. The services sector contributes about 60 percent to the economy, but employs just 27 percent of workforce. By focusing on manufacturing PM Narendra Modi aims to emulate China and other East Asian countries who have successfully achieved rapid economic growth. To achieve high manufacturing growth per year, the government will have to move quickly to address some long-entrenched issues like, ease of doing business, make investments easily available and at lower interest rate, improve infrastructure, do the urbanisation of villages as announced by Finance Minister in his budget speech by creating 100

smart cities across the country and by reforming the labour law as just announced by the PM. But centre government along cannot do it, it needs the active support of states governments as many of the issues mentioned above comes under state government domain.

However, it is inevitable to have some effect on

environment of industrialisation as India put up more and more manufacturing factories but because of fear of environment degradation as advocated by some environmentalist it cannot and must not stop industrialisation as India and its people cannot remain poor forever.

(Courtesy : Business Star, November 2014).



## “GOOD NEWS”

### Indian food ingredients sector surging robustly

THE food ingredient industry is growing steadily in India, helped by rapid urbanization and growing urban middle class population. This was revealed by industry representatives at Food Ingredient and Health Ingredient (Fi & Hi) show which was held at the Bombay Convention & Exhibition Centre, Mumbai from September 29 to October 1, 2014. The taste of the Indian consumer has changed in the last decade due to economic growth and higher incomes. Hectic pace and a growing inclination towards global cuisine is helping the food and health ingredient industry to grow

and evolve in India. The event also hosted a seminar on "Innovation Food Ingredient & Food Additives and their Roles in the Development of Food Processing". The event is supported by several organisations including Ministry for Food Processing Industries (MoFPI), Agricultural and Processed Food Products Export Development Authority (APEDA), All India Food Processors' Association (AIFPA), and Small & Medium Business Development Chamber of India.

(Courtesy : Business Star, November 2014).

## “GROWTH”

### Food processing industry is growing every single day

FOOD processing has been known from time immemorial, ever since human evolution began. India, espe-



cially, has been a forerunner in giving diverse facets to this art of food processing. Today, we define food processing as any kind of intervention with the available raw produce of agricultural or horticultural origin, thereby adding to its value. It comes as no surprise that the food processing industry connects the farmers with their consumers, adding value on the way. India's food processing sector spans a wide range of products that includes fruits and veg-



etables, meat, fish, seafood and poultry; dairy and dairy products; fermented foods and drinks; grains, cereals and millets; bakeries; confectionery; nutraceuticals; etc. Of these, RTE (ready to eat) and RTH (ready to heat) foods have grabbed special attention. It is a well-known fact that in today's world, time has become extremely precious, and a fast-paced world has got habituated, in fact, addicted, to a ready-made culture, where fresh fruits are cleaned, sliced and wrapped without preservatives and made available on the go. With no time to cook a meal, RTE and RTH foods come in handy for the busy consumer. The demand from consumers and their willingness to pay that extra buck for convenience are the main reasons behind the roaring business in the food sector, especially in the processed food arena.

The science behind food processing was established on a few basic needs: (a) to increase the shelf life of a product (b) improve the digestibility of the product (c) a trade commodity for economic progress. Today, the Indian food processing industry is recognized as a sunrise industry. The Indian food industry is estimated to grow to about \$200 billion by 2015. Thus, it could lead to significant economic development, apart from providing employment opportunities. The food park recently inaugurated by Prime Minister Narendra Modi at Tumkur in Karnataka is a good example. Such mega food parks may steer the nation towards income generation, employment opportunities, besides reducing wastage. The basic principles of food processing have revolved around the science of dehydration, pulverizing of raw material for easier cooking and extending shelf life of the product for the convenience of consumption over a longer period. Modern food processing sciences have established various energy-saving methods of addressing these requirements. Advances and innovations in food processing science have established protocols and techniques for

superior retention of flavours, better product integrity and better nutrition benefits. While processed foods have multiple advantages of being hygienic, free from pathogens, sometimes made tastier and healthier too with the addition of flavours and nutrients, they also come with certain disadvantages. Some people believe that processing of food deprives it of its major nutritive properties, rendering the product tasty but less nutritious, although in reality, processing reduces the nutritive value only by a minimal amount. However, use of preservatives and food additives are common in the food processing industry, and these could render the commodity toxic and unsafe if proper care is not taken.

The Central Food Technological Research Institute (CFTRI) has been part of the evolution of the Indian food industry since the time of independence. CFTRI has been instrumental in providing technologies to many entrepreneurs and industries that have modernized the pantries of Indian households, besides large-scale production to meet domestic and overseas demands. Processed food in India will continue to stay so long as we see changing lifestyles, increasing numbers of working women, disposable incomes and trendy attitudes. Besides, the government is keen on encouraging this industry by promoting joint ventures, giving industrial licences, introducing schemes for technology upgrade, and establishing and modernizing processing industries. In conclusion, the future of the food processing industry is dazzling, with food safety, quality assurance and hygiene norms gaining importance. The stringent rules laid by the government are sure to take this industry to global standards. To top it all, the allocation of Rs 2,000 crore for the food processing industry in the budget is sure to provide an impetus to this sector in India.

*(Courtesy : Business Star, November 2014).*



## “GOOD NEWS”

### NSDC signs MoU with Assocom India

THE National Skill Development Corporation (NSDC), under a public-private partnership promoted by the finance ministry, signed a memorandum of understanding (MoU) with Assocom India Pvt Ltd (one of India's premier food consulting and skill education companies) to create employment opportunities for the youth by imparting quality training in the baking, milling and food technology sectors. Raj Kapoor, chief executive officer and managing director, Assocom India Pvt Ltd, and Dilip Chenoy, managing director and chief executive officer, NSDC, exchanged the signed copies of the MOU. Assocom India, through the Assocom Institute of Bakery Technology (AIBTM), plans to train over one lakh people over the next ten years.

It would provide bakery skills training across India; impart knowledge, training and skills in

bakery, culinary art, flour milling, event management and allied subjects; create awareness on information technology and its applications in the hospitality industry; develop a course curriculum to focus on bakery operations, management, product development, entrepreneurship and implementation with inculcation of skills equipping the trainees to find placements and compete in competitive market, provide students with an opportunity to gain hands-on experience and training in hospitality as a profession, and provide state-of-the-art technology and management expertise to enable direct and significant upgradation of skills in the sector. The collaboration seeks to create new opportunities.

*(Courtesy :  
Business Star, November 2014).*

# Technology

## “HUMBLE GUAR MEETS THE NEED”

### Guar Meal : A Promising Quality Protein Source for Feeding Dairy Animals

by

M.S. Mahesh and S.S. Thakur

INDIA, being a global leader in terms of annual milk production, has a vast bovine population of over 299 million (DAHD, 2012). Despite the fact that around 140 mt of milk is likely to be produced during 2014 (Bhasin, 2014), the average milk production per animal is —26-51% lower than the attainable yield (Dikshit and BIRTHAL, 2010). One of the principal contributing factors for this poor productivity is the inadequate supply of feeds and fodders to meet the nutrient requirements of dairy animals. While, a large number of agro-industrial byproducts are available in India, their utilization for livestock feeding has not been achieved fully either due to a lack of scientific literature or the presence of antinutrients. In this respect, guar meal, a co-product of guar gum industry, can be explored as a

potential protein feed source for dairy animals in India.

Guar or cluster bean (*Cyamopsis tetragonoloba*) is an annual drought tolerant leguminous crop of arid regions producing 5-12 hard seeds contained in a pod. The word 'guar' has been originated from Sanskrit 'gau aahar' meaning cattle feed (Amarjeet et al, 2014). India is leading country in total guar seed production (>15 lakh tonnes) notably from the states of Rajasthan and Haryana, contributing to 80% of world guar trade (Tran, 2014). Major commercial utility of guar today is for its high viscous galactomannan gum (a natural hydrocolloid) which is used in food industry (as thickener and stabilizer), textile, cosmetics, paper and oil industry. Whole guar bean contains hydrocolloids (23%), fat (40%) and protein (34%). Guar meal is the main by-product of guar gum production, which is made up of a mixture of guar germs (25%) and hulls (75%) (Fig. 1). Due to its high protein, it is used as an ingredient in cattle feeding.

Table 1:  
Guar seed processing yields protein rich guar meal and endosperm (gum).

Nutrient	Guar Meal
Organic matter	95.83
Crude protein	48.19
Ether extract	5.14
Total carbohydrates	42.50
Non-fibrous carbohydrates	12.50
Ash	4.17
Crude fibre	11.97
Neutral detergent fibre	30.00
Acid detergent fibre	12.40
Hemicellulose	17.60
Cellulose	11.71
Lignin	0.69
Silica	0.24
Calcium	1.62
Phosphorus	0.07

Compiled from Garg et al (2003), Greival et al (2014) and CQ Rama Rao et al (2014).

#### Feeding value of guar meal for cattle and buffaloes

In India, guar meal is available mainly in two forms — guar meal churi (40-48% protein) and guar meal korma (50-55% protein), classified on the basis of protein content. Detailed chemical composition as well as Bureau of Indian Standards (BIS) specification is presented in Table 1 and 2, respectively. Amino acid composition (Table 3) reveals that guar meal is one of the best protein sources as it is rich in lysine (1.72% DM) and sulfur containing amino acids (0.96% DM) at a concentration greater than that of groundnut cake (Tran, 2014) with comparable methionine content (Jongwe et al, 2014) and energy value (80% total digestible nutrients). The major constraint in its feeding is its

**Use of non-traditional feedstuffs in dairy cattle feeding avoids dependency on conventional ingredients whose prices have been increasing steadily in the recent past. guar or cluster bean is an annual drought tolerant leguminous crop of arid regions. Due to its high protein, it is used as an ingredient in cattle feeding. A recent study conducted at national Dairy Research Institute showed a better growth rate and feed conversion ratio in growing crossbred calves.**

bitter taste which effects the palatability of feed. INcriminating factors like trypsin inhibitors, haemagglutinins, saponins and phytic acid, besides 18-20% of residual gum impedes its complete utilization. Tehrefore, roasted guar meal is employed in feeding of monogastric animals. Nevethless, guar meal supports optimum growth and lactation performance of dairy ruminants.

Guar meal supports optimum growth and lactation performance of dairy ruminants. Recent study conducted at national Dairy Research Institute showed a better growth and feed conver-

sion ratio in growing crossbred calves fed with guar meal replacing 50% of groundnut cake for a 90 days. However, at 75% inclusion, pereformance was reduced but upon supplementation of sweeteners (Sucram) and flavours (Lactovanilla), respectively at 0.025% in the concentrate mixture, growth rate was improved (Goswami et al 2012). However guar meal incorporation did not affect any blood metabolites like glucose, urea nitrogen and immunoglobulins. Similary, Grewal et al (2014) noted that guar by products like guar korma and guar churi could safely replace 8% of soyabean meal in the concentrate mixture of buffaloes. In case of growing

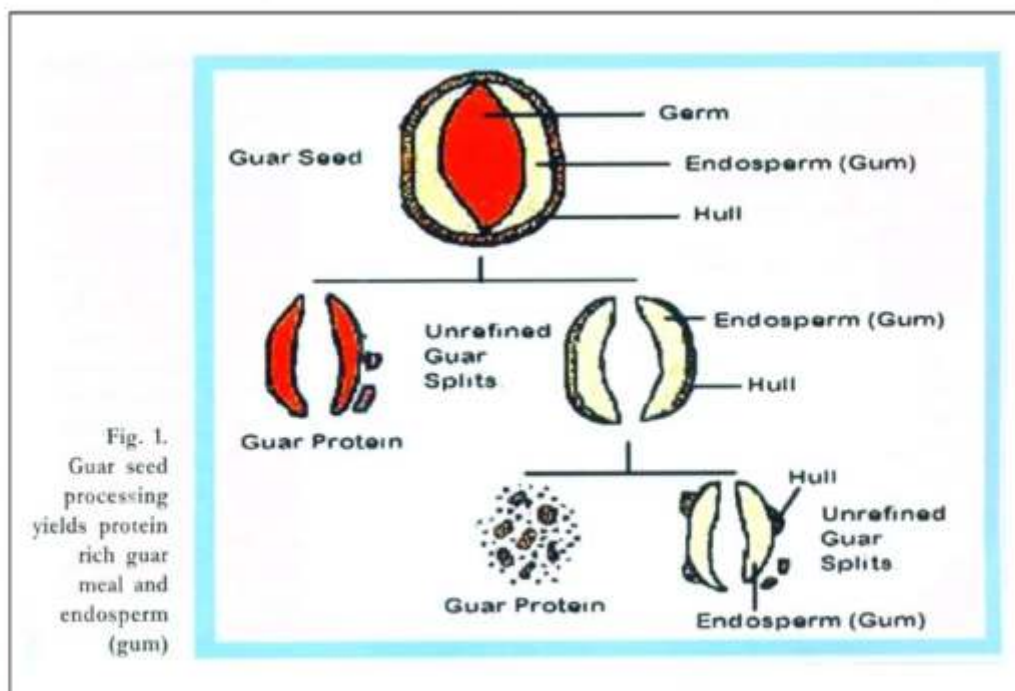


Fig. 1. Guar seed processing yields protein rich guar meal and endosperm (gum)

**Table 2: BIS specifications for guar meal**

Characteristic	Requirement
Moisture, per cent by mass, Max.	10
Crude protein, per cent by mass, Min.	45
Ether extract, per cent by mass, Min.	3.0
Crude fibre, per cent by mass, Max.	8.0
Total ash, per cent by mass, Max.	7.0
Acid insoluble ash, per cent by mass, Max.	1.5

**Table 3: Comparative amino acid (%CP) profile of guar meal and groundnut cake (Jongwe et al, 2014)**

Amino acid	Guar meal	Groundnut cake
Aspartate	10.39	8.17
Glutamate	13.06	12.08
Serine	3.86	3.61
Glycine	4.23	4.09
Histidine	2.77	2.37
Arginine	8.95	8.54
Proline	2.97	4.13
Threonine	4.05	2.69
Valine	3.59	3.89
Methionine	1.80	1.20
Isoleucine	3.78	3.99
Leucine	6.27	6.50
Phenylalanine	4.13	4.89
Lysine	3.80	3.25

Sahiwal calves, inclusion of guar meal at 15% in concentrate mixture was found to be economical without impairing daily gain as compared to cottonseed cake based control diet (Nazar et al, 2013). In a lactation study, it was noted that milk production was similar in Sahiwal cows receiving guar meal replacing 75% of groundnut cake in the concentrate. Moreover, milk yield and composition as well as blood concentrations of glucose and urea nitrogen were not altered by dietary inclusion of guar meal (Jongwe et al, 2014). Moreover, 50% replacement of cotton seed cake

by guar meal exhibited higher milk yield in Holstein cows (Salehpour and Qazvinian, 2011). Similarly, positive effects on growth performance were also documented in buffalo calves (Mandal et al, 1989). Though cows generally refuse guar meal initially, they get accustomed to its taste over a period of 15-20 days (Jongwe et al, 2014). Raw guar meal protein is highly degradable (>70%), Garg et al (2003) and scientists at National Dairy Development Board (Anand) treated guar meal with 40% formaldehyde (6ml/kg) to make protein bypassed from ruminal degradation. Upon feed-

ing 1 kg of this treated meal, milk yield was improved by 7% with slightly higher milk fat by 0.2 units. Further, Yadav et al (2000) also found an improved body weight gain, feed conversion with a reduction in blood urea levels in buffalo calves fed with formaldehyde (15 g/kg) treated guar meal, implying efficient utilization of protein from treated guar meal. Furthermore, crushed guar seeds increased dry matter intake and digestibility when included at 150 g/head in Marwari ewes grazing sewan grass (*Lasiurus indicus*) (Thakur et al, 1985). All these studies suggest that guar meal can be safely incorporated in ruminant rations at 10-25% levels.

### **Conclusion**

Use of non-traditional feedstuffs in dairy cattle-feeding avoids dependency on conventional in-

gredients, whose prices have been steadily increasing in the-recent past. With respect to guar meal, a gradual incorporation in the diet is suggested to adjust for its pungent taste and avoid digestive upset (diarrhoea) due to presence of residual gum. As guar meal is rich in both protein of good amino acid profile as well as energy, its judicious utilization for ruminant feeding is advocated specially in the arid zones to improve animal performance on one hand, and to partially mitigate feed scarcity problems prevalent in India.

### **References**

Authors may be contacted through email for references.

*(Courtesy : Indian Dairyman, february 2015),*