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NEWS LETTER

OIL TECHNOLOGISTS' ASSOCIATION OF INDIA
WESTERN ZONE

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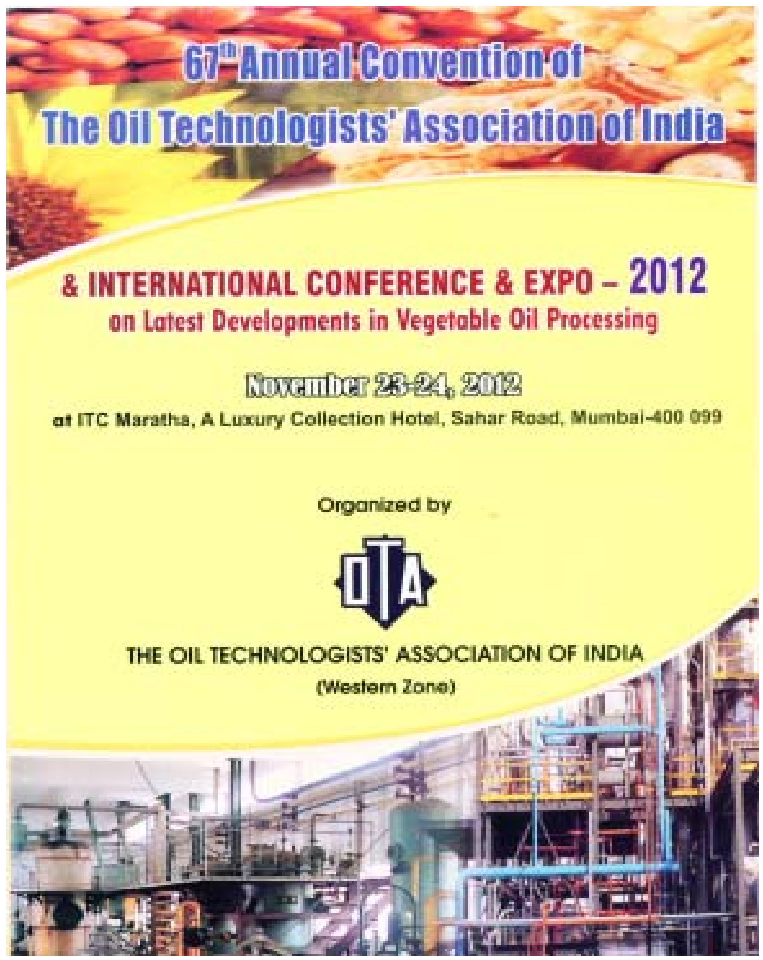

This news letter is for free circulation only to the members of OTAI-WZ

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From the Editors's Desk

HERE IT COMES

The Oil Technologists Association of India (Western Zone) is hidding its 67th Annual Convention and International Conference and Expo - 2012. Subject will be exciting. " Latest Developments in Vegetable Oil Processing". Listen to the experts eloquently presenting high level of technology and automation - High Capacities - over 1000 MT in direct extraction and 500 MT of oil for Refining and exciting products. Listen to all this. Come one and come all. Be thrilled by the speakers. If you can also contribute. come immediately contact the President or any Team Member - the Convenor at el. We need your presence. Your contributors - content and Finance will be great contribution.

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Trade & Commerce

GLISTENING, Eh?

Malachite Green contamination

THE problem of contamination of Malachite green in Rapeseed meal exported to China continues to haunt us. Based on the directive from Ministry of Commerce, the Export Inspection Council of India (EIC) jointly with the Association, during December, conducted a survey to determine the probable source of contamination of malachite green. After a detailed study it was concluded that the source of malachite contamination is the green dye which is used for marking the jute bags. The Association has issued an Advisory note immediately to all the extraction plants requesting them not to buy rapeseed or rapeseed cake packed in jute bags with green identification marks and also ensure that the jute bags used for packing rapeseed meal is not marked with malachite green dye to avoid the aforesaid contamination. It is in our interest to ensure that the entire supply chain comprising of farmers, oil mills, intermediaries and exporters are informed not to use malachite green for marking the jute bags. A wide publicity of this matter by all stakeholders will immensely help our industry to solve this contentious problem.

The Ministry of Commerce has forwarded the EIC findings to the Chinese Quarantine Authority. However, unfortunately the Chinese authorities are not satisfied with the report and have excluded India from the list of approved countries for import of feed stuff and feed additives with effect from 1st January, 2012. This is a very serious development which will affect the exports of oilmeals badly since China is a big market for India. The Association is fully seized of this problem and is assiduously trying to resolve this issue through the Ministry of Commerce and Embassy of India, Beijing. In the meanwhile, as desired by the Chinese Authorities, SEA has invited a delegation of their Quarantine Department to visit India in Feb/March, 2012 to study the crushing practice followed in India and satisfy themselves. We have also met the commerce and Trade and Plant protection department to impress upon them the urgent need to resolve this matter.

(Courtesy : SEA News Circular, Vol. XIV, Issue No. 10, Jan., 2012).

For every worry under the sun, there is a remedy or there is none, if there be one,find it,if there be none,do not mind it!

FAR TOO MANY !

Government plans to launch satellite

THE government intends to launch a satellite for agricultural monitoring as part of its plan to improve the accuracy of farm output forecasts. But a critical element of this plan -better field-level survey of farmers' sowing preferences - is yet to get off the ground, thanks to a statistical stand-off between the agriculture ministry and an expert panel on farm statistics, which submitted its report last February. "The problem is that the committee's focus was on getting estimates within a bound of error for all India, for which a sample size of 15,000 villages was suggested. But the agriculture ministry also wants district-level estimates, for which they have a problem with a sample size of 15,000," said chief statistician of India TC Anant. As per the current system, the government gets production estimates of 27 major crops from state governments for a sample of 1.2 lakh villages. But, as pointed out by experts, these have been prone to error, as they largely rely on overburdened local revenue officials, or patwaris. The ministry had appointed an expert committee under agriculture economist A Vaidyanathan in 2009 to suggest a framework for improving agriculture statistics. The panel, whose report has the backing of the Planning Commission, has suggested creating a new cadre of workers focused on collecting farm data.

"The committee thinks that around 15,000 villages could be adequate to get reliable all India estimates for policy. The current 1.2 lakh villages is impossible to manage and we need a system that is manageable to control large errors," Vaidyanathan told ET.

At a recent meeting, Planning Commission member Abhijit Sen sought urgent action from the ministry on accepting the committee's key recommendation of forming a National Crop Statistics Centre, which would give all-India estimates of farm output. Sen said he was insisting on the change but there was “a certain reluctance”.

The ministry agrees with the need to get its own people to collect field-level data, but isn’t convinced about the dramatic reduction in sample size proposed by the panel.

Agriculture secretary PK Basu said the first step towards implementation of the recommendations would be to decide the sample size for estimating each crop, as 15,000 is just a ballpark figure.

Sen agreed that sampling errors will rise as one replaces the sample from 20% of the villages to 2.5%. However, the real concern in the current farm output estimates is the non-sampling error. “The current system gives final estimates one-and-half years late, and almost every year there is a 10% error between the first and the final estimates,” Sen said.

(Courtesy : SEA News Circular, Vol. XIV, Issue No. 10, Jan., 2012).

How we stand !FAR TOO MANY !

States	Estimated Production of Oilseeds (‘000 Tonnes)					Incr. (+) / Decr (-) during ’10-11 compar. to ’06-07	
	’06-07	’07-08	’08-09	’09-’ 10	’10-11*	Quantity	% Chng
J&K	42.3	53.3	49.6	49.7	49.8	7.5	17.6
Punjab	78.2	76.5	76.2	83.4	71.2	-7.0	-9.1
Haryana	834.6	642.8	932.8	877.5	964.0	129.4	15.5
Rajasthan	5166.8	4197.6	5178.4	4407.2	6090.2	923.4	17.9
Uttar Pradesh	1033.3	1146.8	1164.5	816.0	911.0	-122.3	-11.8
Bihar	147.4	137.9	138.0	144.6	155.2	7.8	5.3
Assam	134.0	139.0	137.9	144.7	152.0	18.0	13.4
W-Bengal	645.4	705.1	582.6	727.1	760.6	115.2	17.8
Jharkhand	50.0	68.8	73.2	79.6	88.5	38.5	77.0
Orissa	175.1	196.6	180.3	172.1	183.4	8.3	4.8
Chhattisgarh	161.4	192.6	193.5	200.4	217.2	55.8	34.6
Madhya Pradesh	5814.2	6352.0	6976.9	7636.2	8035.4	2221.2	38.2
Gujarat	2569.0	4725.0	4015.9	3097.0	3911.9	1342.9	52.3
Maharashtra	3721.0	4874.0	3409.7	2814.0	4997.0	1276.0	34.3
Andhra Pradesh	1362.0	3390.0	2189.1	1500.0	1986.0	624.0	45.8
Karnataka	1125.0	1549.0	1212.0	1005.0	1212.0	87.0	7.7
Tamil Nadu	1083.5	1146.7	1043.0	939.6	1131.9	48.4	4.5
Others	146.2	161.6	165.5	187.7	183.5	37.3	25.5
All India	**24289.4**	**29755.3**	**27719.0**	**24881.7**	**3110.8**	**6811.4**	**28.0**

* 4th Advance Estimate.

States	Total Consumption of Oilseeds ('000 Tonnes)					Incr. (+)/Decr(-) during '10-11 compar. to '06-07	
	'06-07	'07-08	'08-09	'09-'10	'10-11*	Quantity	% Chng
Punjab	22.9	23.1	23.3	23.4	23.6	0.7	3.0
Haryana	62.0	63.1	64.3	65.5	66.6	4.6	7.5
Rajasthan	2489.5	2534.5	2579.1	2623.2	2666.6	177.1	7.1
Uttar Pradesh	2823.1	2875.2	2927.5	2979.9	3032.1	209.0	7.4
Bihar	20395.9	20716.8	21030.6	21337.5	21637.4	1241.5	6.1
Assam	1967.3	1994.0	2020.4	2046.6	2072.8	105.5	5.4
W-Bengal	21437.3	21659.2	21873.1	22081.9	22289.0	851.7	4.0
Jharkhand	5229.4	5311.5	5392.3	5472.6	5553.3	323.9	6.2
Orissa	12123.6	12246.0	12365.6	12482.9	12598.9	475.3	3.9
Chhattisgarh	2747.6	2794.4	2840.9	2887.3	2933.8	186.2	6.8
Madhya Pradesh	5560.7	5660.7	5759.9	5858.6	5957.0	396.2	7.1
Gujarat	11124.9	11291.0	11455.0	11617.1	11777.1	652.2	5.9
Maharashtra	18249.8	18529.6	18809.4	19087.6	19362.6	1112.8	6.1
Andhra Pradesh	8223.1	8307.8	8390.5	8471.5	8550.8	327.8	4.0
Karnataka	10412.9	10529.6	10644.3	10757.3	10868.7	455.8	4.4
Kerala	8887.5	8959.1	9029.5	9098.2	9164.9	277.4	3.1
Tamil Nadu	19356.2	19520.5	19680.0	19835.3	19986.5	630.2	3.3
All India	**15113.8**	**153016.0**	**54885.7**	**156726.2**	**58541.7**	**7427.9**	**4.9**

Note : Consumption of Pulses and Oilseeds is based upon per capita consumption of Pulses and Oilseeds as per Consumer Expenditure Survey by NSSO for the year 2004-05 (latest available) and projected population (as on 01.09-2007 released by Registrar General of India (Censes).

USEFUL INFO !

World Agricultural Supply and Demand Estimates

GLOBAL oilseed production for 2011/12 is projected at 457.6 million tons, up 2.8 million tons from last month. Foreign (to USA) oilseed production accounts for most of the change with increases projected for soybeans, rape-seed, sunflowerseed, and peanuts. Global soybean production is projected at 259.2 million tons, up 0.3 million. Increased production for Canada and India is only partly offset by a lower projection for China. Global rape-seed production is projected higher this month mainly due to gains for Canada. Canada rapeseed production is raised 1.3 million tons to 14.2 million based on the latest survey results from Statistics Canada. Higher yields account for most of the change. Rapeseed production for China is reduced 0.3 million tons due to lower yields in line with the latest indications from the China National Grain and Oils Information Center. Other changes include increased sunflowerseed production for Ukraine and increased peanut production for China and India. Global oilseed trade is projected at 114 million tons, up 0.7 million from last month. Increased soybean exports from Brazil, increased rapeseed and soybean exports from Canada, and increased peanut exports from China and India account for most of the gains. Global oilseed ending stocks are projected at 75.5 million tons, up 1.6 million from last month mainly reflecting increased soybean stocks in the United States and increased rapeseed stocks in Canada.

Global coarse grain supplies for 2011/12 are projected 7.4 million tons higher as lower beginning stocks for corn and barley are more than offset by an 8.5-million-ton increase in corn production, mostly reflecting higher output from China. Global corn beginning stocks for 2011/12 are reduced 0.8 million tons with a downward revision to 2010/ 11 production for South Africa.

Global corn production for 2011/12 is projected at a new record high of 867.5 million tons, despite a 3.5-million-ton decline year-to-year in the United States. Foreign corn production is expected to be up 43.4 million tons from 2010/11. China 2011/12 production is raised 7.3 million tons this month to a record 191.8 million tons based on the recently released estimate from the National Bureau of Statistics. Corn production is also raised 1.0 million tons for EU-27 and 0.7 million tons for Canada based on the latest government reports. Corn imports are lowered 0.5 million tons for EU-27 with the larger crop and lower expected shipments from Serbia. Global corn consumption is raised mostly reflecting a 2.0-million-ton increase in China corn feeding. Global corn ending stocks are projected 5.6 million tons higher, mostly on increased stocks in China. At the projected 127.2 million tons, world ending stocks remain at a 5-year low. (Source: USDA; World Agricultural Supply and Demand Estimates 9th Dec 2011),

(Courtesy : SEA News Circular, Vol. XIV, Issue No. 9, Jan., 2012).

HOW CONE ?

Netherlands keen to lend agri-technology support

THE Netherlands is keen to lend agri technology support to Karnataka. Henk van Duijn, agricultural counsellor, ministry of economic affairs, agriculture and innovation, The Netherlands, who was present for the Global Agribusiness and Food Processing Summit 2011 said that it had signed a pact to transfer technology from Dutch companies in agro practices and food processing, in October 2010. This year it is looking at opportunities to expand its presence in the state.

Currently the Netherlands accounts for US$75 billion of agricultural exports and its imports in the sector are valued at US$50 billion. The country was looking to team up with the best companies in the area of agriculture. The Netherlands also held leadership status in the world in dairy cooperative and food processing. “In the area of seed propagation, companies like Monsanto, Syngenta and Bayer had made strategic acquisitions in Netherlands-based seed companies to garner fast growth prospects in the field. The strengths in seed production will help farmers to maximise their revenue generation,” he said.

The Netherlands can offer expertise in smart greenhouse, water-saving technologies, and energy-saving solutions to adhere to the requirements of climate change. It is also known for its biological pest control techniques, which have helped farmlands increase the productivity by 25 per cent. (Source :F&B News Dated 17th Dec 2011)

(Courtesy : SEA News Circular, Vol. XIV, Issue No. 9, Jan., 2012).

CATCH THE FISH !

Subsidies may be farmed out via large corporates

FOR the first time, the Centre plans to partly route its farm subsidies through large companies with expertise in rural linkages. A blueprint is being created under which the government will partly fund agri-projects of companies.

These companies will, in turn, have to deliver measurable increase in yield, infrastructure and incomes of at least 10,000 farmers each, said a senior official in the ministry of agriculture, who did not wish to be named. The expenditure on each farmer is expected to be Rs 1 lakh over three years, of which the Centre will pay half.

The rest has to be arranged by the company by creating a consortium of lenders to the project and through its own resources. The government’s target is to reach 1 million farmers over the next five years with a kitty of Rs 5,000 crore. If the company meets its targets, it will receive 8% of the project cost as reimbursement of overheads. The scheme is expected to be announced in next year’s Budget speech after the Planning Commission approves it.

“This is the first time the Centre will directly implement its farm-related schemes. So far it has only worked through states. But there is a huge disparity between states in the capacity to deliver desired outcomes. An analysis of current programmes shows that public-private partnership would be the best route for future success," the official said.

The co-operation of a state government will be sought when a project comes up for appraisal and sanction. In their new role as implementers of the Centre's schemes, companies will be able to build a firm supply chain and also become the farmer's one-stop solution provider for everything - from seeds, technology and irrigation to post-harvest crop management and marketing, said Bhaskar Reddy, director, FICCI.

(Courtesy : SEA News Circular, Vol. XIV, Issue No. 9, Jan., 2012).

MISSING TARGETS ?

33rd ALL INDIA SEMINAR ON RABI OILSEEDS, OIL TRADE & INDUSTRY ON 18th MARCH, 2012 AT DELHI

COOIT'S ESTIMATES OF PRODUCTION AND MARKETABLE SURPLUS OF OILSEEDS AND AVAILABILITY OF VEGETABLE OILS DURING OIL YEAR 2011-12 (NOV-OCT)

1. GROUNDNUT (IN LAKH TONNES)

Sr. No.	State	Trade Estimate 2011-12 SEASON Kharif	Rabi	Total	2010-11 SEASON Kharif	Rabi	Total
1.	Guj'arat	17.75	2.50	20.25	18.70	2.30	21.00
2.	Maharashtra	1.80	1.00	2.80	2.00	0.50	2.50
3.	Andhra Pradesh	5.50	4.00	9.50	6.00	4.80	10.80
4.	Tamil Nadu	3.50	4.60	8.10	2.00	2.90	4.90
5.	Karnataka	3.50	3.20	6.70	4.00	3.40	7.40
6.	MadhyaPradesh/C.G.	1.80	..	1.80	1.50	—	1.50
7.	Rajasthan	5.50	__	5.50	4.50	_	4.50
8.	Punjab/Haryana/U . P	0.80	__	0.80	0.80	„	0.80
9.	Orissa	1.00	2.50	3.50	1.00	2.50	3.50
10.	Others	0.60	0.60	1.20	0.50	1.00	1.50
	Total in Shells	41.75	18.40	60.15	41.00	17.40	58.40
	Equivalent in Kernals (70%)	29.20	12.90	42.10	28.70	12.20	40.90
	Less:-Retained for sowing	6.30	1.20	7.50	20.00	2.50	22.50
	Export	3.60	1.40	5.00			
	Direct Consumption	13.60	4.40	18.00			
	Sub Total	23.50	7.00	30.50			
	Marketable surplus (In kernals for crushing)	5.70	5.90	11.60	8.70	9.70	18.40

2. SOYBEAN

Sr. No.	State	2011-12 SEASON Kharif	Rabi	Trade Estimate Total	2010-11 SEASON Kharif	Rabi	Total
1.	Madhya Pradesh	55.00	—	55.00	56.00	—	56.00
2.	Maharashtra	35.00	—	35.00	27.00	—	27.00
3.	Andhra Pradesh	1.60	—	1.60	1.50	—	1.50
4.	Rajasthan	10.00	—	10.00	6.50	—	6.50
5.	Karnataka	2.40	—	2.40	1.80	—	1.80
6.	Chhatisaarh	1.50	—	1.50	1.60	—	1.60
7.	Others	1.00	—	1.00	0.60	—	0.60
Total		106.50	—	106.50	95.00	—	95.00
Retained for sowing & direct consumption		12.00	—	12.00	8.00	—	8.00
Marketable surplus forcrushing		94.50	—	94.50	87.00	—	87.00

(R) : Revised on 18.3.2012

3. RAPE/MUSTARD/TORIA

Sr. No.	State	2011-12 SEASON Kharif	Rabi	Trade Estimate Total	2010-11 SEASON Kharif	Rabi	Total
1.	Uttar Pradesh	1.00	9.00	10.00	0.70	9.00	9.70
2.	Rajasthan	—	27.50	27.50	—	35.00	35.00
3.	Punjab/Haryana	0.50	6.00	6.50	0.30	7.70	8.00
4.	Gujarat	—	2.40	2.40	—	3.30	3.30
5.	M.P./Chhatisgarh	—	6.90	6.90	—	7.50	7.50
6.	West Bengal	—	3.00	3.00	—	3.20	3.20
7.	Eastern India & Others	—	4.00	4.00	—	4.30	4.30
	Total	1.50	58.80	60.30	1.00	70.00	71.00
Retained for sowing & direct consumption		—	2.00	2.00	—	2.00	2.00
Marketable surplus for crushing		1.50	56.80	58.30	1.00	68.00	69.00

4. SUNFLOWERSEED

Sr. No.	State	Trade Estimate					
		2011-12 SEASON			2010-11 SEASON		
		Kharif	Rabi	Total	Kharif	Rabi	Total
1.	Karnataka	0.90	2.00	2.90	0.60	2.20	2.80
2.	Andhra Pradesh	0.10	1.40	1.50	0.30	1.30	1.60
3.	Maharashtra	0.20	0.60	0.80	0.35	1.00	1.35
4.	Tamilnadu	—	—	—	—	—	—
5.	Punjab	—	—	—	—	—	—
6.	Haryana	—	—	—	—	—	—
7.	Uttar Pradesh	—	—	—	—	—	—
8.	Bihar	—	—	—	—	0.30	0.30
9.	Others	—	1.00	1.00	0.10	0.40	0.50
	Total	1.20	5.00	6.20	1.35	5.20	6.55
	Retained for sowing direct consumption & export	—	—	—	—	—	—
	Marketable surplus for crushing	1.20	5.00	6.20	1.35	5.20	6.55

5. SESAMESEED

Sr. No.	State	Trade Estimate					
		2011-12 SEASON			2010-11 SEASON		
		Kharif	Rabi	Total	Kharif	Rabi	Total
1.	Gujarat	0.40	0.60	1.00	0.50	0.40	0.90
2.	Rajasthan	1.10	—	1.10	1.30	—	1.30
3.	Tamil Nadu	0.10	0.30	0.40	0.10	0.25	0.35
4.	Madhya Pradesh/C.G.	0.50	—	0.50	0.70	—	0.70
5.	Andhra Pradesh	0.10	0.20	0.30	0.20	0.20	0.40
6.	Maharashtra	0.10	—	0.10	0.10	—	0.10
7.	Karnataka	0.15	—	0.15	0.20	—	0.20
8.	U.P./Uttranchal	1.00	—	1.00	0.80	—	0.80
9.	West Bengal	—	1.50	1.50	—	1.50	1.50
10.	Orissa	0.50	0.70	1.20	0.45	0.75	1.20
11.	Others	0.25	0.10	0.35	0.05	0.05	0.10
	Total	4.20	3.40	7.60	4.40	3.15	7.55
	Retained for sowing. direct consumption & export	3.50	0.50	4.00	3.00	0.50	3.50
	Marketable surplus for **crushing**	**0.70**	**2.90**	**3.60**	**1.40**	**2.65**	**4.05**

6. CASTORSEED

Sr. No.	State	Trade Estimate 2011-12 SEASON Kharif	Rabi	Total	2010-11 SEASON Kharif	Rabi	Total
1.	Gujarat	12.20	—	12.20	8.60	—	8.60
2.	Rajasthan	2.10	—	2.10	1.60	—	1.60
3.	Andhra Pradesh	1.60	—	1.60	1.40	—	1.40
4.	Maharashtra & Others	0.30	—	0.30	0.30	—	0.30
Total		16.20	—	16.20	11.90	—	11.90
Retained for sowing & export		—	—	—	—	—	—
Marketable surplus for crushing		16.20	—	16.20	11.90	—	11.90

7. NIGER SEED

Sr. No.	State	Trade Estimate 2011-12 SEASON Kharif	Rabi	Total	2010-11 SEASON Kharif	Rabi	Total
1.	Orissa	0.25	—	0.25	0.25	—	0.25
2.	M.P. & Chhattisgarh	0.20	—	0.20	0.50	—	0.50
3.	Others	0.45	—	0.45	0.25	—	0.25
Total		0.90	—	0.90	1.00	—	1.00
Retained for sowing & export		0.30	—	0.30	0.30	—	0.30
Marketable surplus for crushing		0.60	—	0.60	0.70	—	0.70

8. SAFFLOWERSEED (KARDI)

Sr. No.	State	Trade Estimate 2011-12 SEASON Kharif	Rabi	Total	2010-11 SEASON Kharif	Rabi	Total
1.	Maharashtra	—	0.60	0.60	—	0.85	0.85
2.	Karnataka	—	0.25	0.25	—	0.40	0.40
3.	Andhra Pradesh	—	0.10	0.10	—	0.05	0.05
4.	Others	—	0.05	0.05	—	0.05	0.05
	Total	—	1.00	1.00	—	1.40	1.40
Retained for sowing & direct consumption		—	0.10	0.10	—	0.10	0.10
Marketable surplus for crushing		—	0.90	0.90	—	1.30	1.30

9. LINSEED

Sr. No.	State	2011-12 SEASON Kharif	Rabi	Total	2010-11 SEASON Kharif	Rabi	Total
		Trade Estimate					
1.	Madhya Pradesh	—	0.45	0.45	—	0.70	0.70
2.	Uttar Pradesh	—	0.10	0.10	—	0.10	0.10
3.	Maharashtra	—	0.10	0.10	—	0.15	0.15
4.	Bihar	—			—	0.15	0.15
5.	Nagaland	—	0.65	0.65	—	0.15	0.15
6.	Others	—			—	0.35	0.35
	Total	—	1.30	1.30	—	1.60	1.60
	Retained for sowing & direct consumption	—	—	—	—	—	—
	Marketable surplus for crushing	—	1.30	1.30	—	1.60	1.60

TOTAL ESTIMATED PRODUCTION OF NINE MAJOR OILSEEDS

	2011-12 SEASON	2010-11 SEASON	CHANGE
Kharif	172.25 (R)	155.65	(+) 16.60
Rabi	87.90	98.75	(-) 10.85
Total	260.15	254.40	(+) 5.75

COTTONSEED

	2011-12 SEASON (R)	2010-11 SEASON
Bales of Cotton (170 Kg. each)	345.00 Lakh Bales	325.00 Lakh Bales
Cottonseed Production @ 310 Kg/Bale	106.95 Lakh Tonnes	100.75 Lakh Tonnes
Retained for Sowing & Direct Consumption	5.50 Lakh Tonnes	5.00 Lakh Tonnes
Marketable Surplus	101.45 Lakh Tonnes	95.75 Lakh Tonnes
Production of Washed Cottonseed Oil (11.5%)	11.67 Lakh Tonnes	11.97 Lakh Tonnes (12.5%)

(R) : Revised on 18.3.2012

SOLVENT EXTRACTED OILS

S. E. Oils	Estimated for Oil Year 2011-12			Estimated for Oil Year 2010-11		
Rice Bran Oil	Edible	8.50		Edible	8.20	
	Non-Edible	0.30	8.80	Non-Edible	0.30	8.50
Rapeseed			1.50			1.50
Sunflowerseed			0.50			0.60
Groundnut			0.30			0.65
Cottonseed & Others Oils			0.50			0.50
Minor Oils(TBOs)			1.00			1.00
Local Palm Oil			0.70			0.60
Total			13.30			13.35

IMPORTED OIL

Oils	Forecast for Oil Year 2011-12 (Est.) (Nov-Oct)	Oil Year 2010-11 (Nov-Oct)
Edible Oil	88.00/90.00	83.70
Vanaspati	—	—
Non- Edible Oil	3.00/3.50	3.00
Total	91.00/93.50	86.70

TOPS & TURVY

Supreme Court Judgment - A dilemma for the Industry

THE Supreme Court has given recently, a verdict that gums, waxes, soap stocks & fatty acids obtained during the process of refining of vegetable oils are liable for excise duty and they do not qualify for exemption under Notification No. 89/95-CE. In an earlier judgment, in the case of Priyanka Refineries Ltd., the Supreme Court had upheld that the by products obtained during the process of vegetable oil refining are exempted from excise duty under Notification No. 89/95-CE. On the basis of this judgment, the Refiners across the country have been so far availing excise duty exemption on the by products. In fact many Refineries have also received from the department in writing, that they are not liable to pay excise duty on by products. The Supreme Court's contradictory judgments have created utter confusion in the industry as to whether excise duty is applicable on the by products of refining or not. In view of the contradictory judicial decisions and different stand taken by the different excise authorities in different areas/states, the Association has made a reference to Central Board of Excise & Customs to issue an appropriate order under Section 37 B of the Central Excise Ac 1944 for the purpose of uniformity.

(Courtesy : SEA News Circular, Vol. XIV, Issue No. 11, Jan., 2012).

If you want the rainbow, you have to put with the rain

Dooly Parton

GLOBAL CASTOR CONFERENCE 2012

18th February, 2012, Ahmedabad, Gujarat

Welcome Address

Sushil Goenka

President The Solvent Extractors'Association of India

Good morning ladies and gentlemen,

SEA, with the objective of bringing the world Castor fraternity together, has been organising successfully this international Conference for the last ten years. The popularity of this initiative is evident from the growing attendance that we have been having year after year. The intent of such a conference has been to provide the farmers, the manufacturers, importers & exporters, technologists, equipment suppliers, surveyors and other service providers, players from the commodity exchanges and brokers from the Castor business from all over the world, an opportunity to interact with each other to explore opportunities of further growth and resolve issues if any.

Friends, as you may know, India has emerged as the largest producer of Castor seed in the World and meets more than 80% of the castor oil requirement of the world. Gujarat in turn contributes to production and export of 70% of the country's castor oil and it's derivatives. Ahmedabad therefore, has aptly occupied a pre-eminent position in world Castor oil trade. India is currently exporting Castor oil & derivatives worth over Rs.3000 crores (US$ 650 million) per annum.

The global castor oil derivatives market is expanding rapidly with China emerging major player over the last four years.

I am glad to inform you that as compared to other oilseeds, the yield of Castor seeds in the country is much higher. Also it is redeeming to note that the yield of Indian Castor seed is the highest among the Castor growing countries in the world!! I compliment our Agri Scientists for their sustained efforts and thank them sincerely for developing successfully a large number of hybrid varieties. It is of utmost importance to continue our efforts to develop higher yielding varieties of Castor and other oilseeds, which will facilitate the farmers to get a better price realization for their efforts, especially those whose livelihood is dependent on small land holdings. I would like to put on record our sincere appreciation of the farmers for their hard work and their sterling performance, which has enabled India to gain a prestigious position in the international castor business. My salutations to them.

Friends, having achieved significant progress in castor seed productivity it is now essential to apply scientific innovativeness to value addition of castor oil. Though some progress has been made in developing castor oil based value added products, we still have a long way to go. This is evident from the fact that India still exports more than 75% of its castor oil production in its raw form. I would urge the castor oil producers and the scientific community to work hand in hand, in a manner that India gains a position of prominence also in exports of high value castor oil derivatives. I am confident that the entrepreneurial zeal of the castor oil producers coupled with scientific backing of the R & D institutions like IICT, India would soon become a significant player in castor oil derivatives. The time has now come to move from Trade to Technology.

(Courtesy : SEA News Circular, Vol. XIV, Issue No. 11, Jan., 2012).

WHOSE FOOD ?

ICAR estimating Indian food grain production of 250 MT in 2011-12

THE Indian Council of Agriculture Research (ICAR)is estimating foodgrain production of 250 million tonnes for 2011-12. Dr S.

Ayyappan, Director-General of ICAR and Secretary of Department of Agricultural Research and Education, said that 2010-11 was one of the best years in Indian agriculture.The foodgrain production that year was 245 million tonnes. During that year, production of pulses crossed 18 million tonnes. “In 2011 - 12, we are estimating foodgrain production of 250 million tonnes. That includes rice, wheat, pulses, oil seeds, sugar, cotton, milk, meat, fish. eggs etc,” he said. On fisheries sector, he said marine fisheries production could be anywhere between five and six. million tonnes. Inland fisheries production could be around eight million tonnes.

By the end of the 12th Five-Year Plan, that is by 2011, total fisheries production in India will be around 15-16 million tonnes, Dr. Ayyappan said. Stating that agriculture sector is worried today, he said disasters were never discussed in agriculture. “Earlier we heard of floods and droughts. Now we hear of tsunami and landslide in hilly areas. The new issues facing agriculture are frost and events like extreme heat or cold,” he said. On the human resource requirements in agriculture sector, he said agriculture universities now have around 30,000 students. But the sector requires around 60,000 students.

He said ICAR is bringing out a mission called ‘student ready’ in the 12th Plan. “We are trying to make agriculture as exciting and interesting as any other professional education. We are talking of entrepreneurship, skill development in this regard,” Dr Ayyappan said. Recently. ICAR has approved progressive farmers as professors in agriculture universities. They will interact with students to help build capacity, he added.

(Courtesy : Business Empire, January 2012)

SAD INFO

Indian crop productivity half of China’s food grain production

PRODUCTIVITY of major food crops such as wheat, rice, maize and pulses in India is almost half of that in neighbouring China, according to a data. In fact, yield of staple grains like maize and pulses in India is even less than that of countries like Pakistan, Bangladesh, Nepal and Myanmar, the data presented in Parliament. The productivity of rice in India is 3,264 kg per hectare, while in China it is 6,548 kg a hectare, the data compiled by UN’s agriculture body FAO for the year 2010 said.

It is also high in Bangladesh at 4,182 kg/hectare and Myanmar at 4,123 kg per hectare. China also tops the list in wheat with yields of 4,748 kg per hectare, whereas for India it stands at 3,264 kg a hectare. India stands at the bottom in terms of maize and pulses productivity compared to China, Pakistan, Bangladesh, Nepal, Sri Lanka and Myanmar. Bangladesh leads the tally in terms of maize yields with 5,837 kg per hectare, followed by China at 5,459 kg a hectare, Myanmar 3,636 kg/hectare, Pakistan 3,558 kg per hectare, Nepal 2,118 kg every hectare, Sri Lanka 2,806 kg a hectare and in India it is 1,958 kg/hectare.

In pulses, China tops the list with 1,567 kg per hectare followed by Myanmar at 1,114 kg a hectare, Bangladesh at 871 kg/hectare, Nepal 791 kg per hectare, Pakistan 762 kg every hectare, while in India it stands at 694 kg per hectare. Pawar said that productivity depends on factors like rainfall, extent of inputs such as fertiliser, micro-nutrients, seed replacement rate, duration of crop, extent of area sown under any crop and the nature of lands used for cultivation.

To enhance the agricultural production, the government is working on frontier areas of research like marker assisted selection, stem cell research, nanotechnology, cloning genome resource conservation, Pawar said. The National Institute of Abiotic Research Management has been established in Maharashtra to address issues related to impending climate change, he added. That apart, the National Institute of Biotic Stress Management and Indian Institute of Agricultural Biotechnology are in the pipeline for undertaking high quality research, the minister added.

(Courtesy : Business Empire, January 2012)

Castor Crop Survey - Executive summary

Castor prospects - 2011-12

Executive summary

- The Solvent Extractors' Association if India (SEA) is a broad based all India apex body of solvent extraction industry and at present practically all-working solvent extraction units are its members. The association continuously gives feedback to the members about the de velopments taking place in the country and world.
- As one of the activity, SEA was interested in crop estimation for Castor Seeds in Gujarat, Rajasthan and Andhra Pradesh. Thus SEA commissioned Nielsen India to conduct a crop estimation study for Castor Seeds in Gujarat, Rajasthan and Andhra Pradesh.
- Nielsen India is the largest market research agency in the subcontinent with the requisite experience, expertise and infrastructure to conduct such studies.
- Nielsen India is conducting such studies since 2004-05 on behalf of SEA. This year, Pradesh during the period October 2011- February 2012.
- Entire study was carried out in major districts of Gujarat, Rajasthan and Andhra Pradesh. Since for castor harvesting extends up to March/April, this year Nielsen will be conducting survey in 5 rounds.
- The crop estimates presented in this report are based on 3 rounds, 4th and 5th round will be conducte in the month of March and April to finalize the estimates.

ECONOMIC NEWS

Govt. has a strong case to hike value for imported vegetable oil

India's $16-billion vegetable oil industry is agog with rumours of an imminent increase in customs duty on imported vegetable oils. For over a year now, industry and trade associations have been flooding the Government with numerous representations to raise the customs duty on imports or to at least revise the tariff value of refined palmolein upwards to reflect market conditions; but policymakers have remained unmoved.

Now that palm oil prices at the origin (Malaysia, Indonesia) have declined by over 15 per cent (from $1,200 a tonne to a little above $l,000/t), the demand for a hike in duty has gathered strength. Will the Finance Ministry oblige importers and refiners this time?

Given that food inflation is still at elevated levels and New Delhi is still fighting a losing battle against high food prices, a hike in customs duty on imported edible oils appears unthinkable at the moment. Additionally, a weaker rupee is seen neutralising the benefit of fall in overseas edible oil prices in dollar terms. So, a hike in customs duty, for all practical purposes, rules itself out.

Revision of tariff

On the other hand, without doubt there is a strong case for revising the current tariff value of $484 a tonne on refined palmolein upwards. Looking at the current and emerging market conditions, a tariff value of $1,000 a tonne is justified. With customs duty levied at the rate of 7.5 per cent, the Government will collect $75 a tonne on imported refined palmolein, converted into rupees at the current exchange rate. This is nearly double the existing collection per tonne.

With the possibility that the rupee could gain moderately in the coming weeks and at the same time, palm oil market could face further downward pressure, and a hike in tariff value to reflect market conditions may not after all be a bad idea. The move will bring some relief to domestic refineries, but hardly hurt consumers. Most of the refineries depend on imported crude oil for their raw material requirement.

Refined oil arrivals have substantially expanded in the last six months and stood at 9.2 lakh tonnes during November 2011-April 2012, up from 4.9 lakh tonnes during similar period last year.

Why should palm oil prices go down further?

Contrary to loud assertions by many analysts, palm oil prices have weakened considerably. For instance, Malaysian crude palm oil is currently quoted on the exchange at Malaysian ringgit (MYR) 3,100 a tonne, down from MYR 3,600/t early April. Now, prices are poised to decline further and the next target seems to be MYR 2,700/t.

All bearish factors are in operation simultaneously. Palm oil is in peak production season, the US soyabean crop is expected to rebound, crude oil prices have declined, China is holding at least one million tonnes of palm oil, and importantly, the pressure of burgeoning stocks in Malaysia and Indonesia. All these factors in addition to weak seasonal demand have combined to drive speculative capital out of the vegetable oil market.

Usually, the market ignores Indonesian stocks. But from anecdotal evidence it is becoming increasingly clear that Indonesia may be building huge palm oil stocks with some estimates going as high as 6.5 million tonnes. Even assuming some overstatement of the estimated stocks, many concede that Indonesian inventory won't be less than 5.0 million tonnes. Add to this, Malaysia's 2.0 million tonnes, the world is perhaps awash with palm oil. New Delhi must bear this big picture in mind.

Assuming normal weather in the northern hemisphere till harvest time in September/October, there is enough palm oil to ground. Indonesian palm plantations - at least 2.5 million hectares were planted in 2007-2009 - have entered the peak production cycle and are, therefore, yielding with great vigour. (The Hindu Business Line, 1st June, 2012).

(Courtesy : AICOSCA Newsletter, May 2012)

ECONOMIC NEWS

Vegetable oil import bill set to rise 20%

THE weaker rupee, coupled with rising demand and higher global prices, will raise India's import bill for edible oils by 20% to Rs. 50000/- crore, said a senior official of the apex industry body. Cooking oil is the biggest item on India's import list after petroleum products.

"The per capita consumption of vegetable oil is rising by 3.5% In no case, imports will come down this year as consumer can't cut down on essential commodity," said Solvent Extractors Association of India executive director B.V. Metha.

Import for the October 2011-September 2012 season may rise to 9.5 million tonne, nearly 15% more from 8.8 million tonne in the last season. Prices are expected to go up to 15-20% in the coming months,

India imported almost double the volume in Aril at 92S334/- tonne as against 475123/- tonne in April 2011.

Imports reportedly went up by 31% to 4714963 tonne during the first half of the season from 3603541 tonne during the same period last year. (The Economics Times, 23rd May, 2012).

(Courtesy : AICOSCA Newsletter, May 2012)

"NOT A POOR COUSIN"

LECITHIN IN COSMETICS: A MULTIFUNCTIONAL INGREDIENT

PHOSPHOLIPIDS are lipids containing a phosphoric acid residue; they are nature's principal surface-active agents. They are found in all living cells, whether of animal or plant origin. In humans and in animals, the phospholipids are concentrated in the vital organs, such as the brain, liver, and kidney; in vegetables, they are highest in the seeds, nuts, and grains. As constituents of cell membranes, and active participants in metabolic processes, they are essential to life.

Phospholipids of various types are present as minor components (0.5 to 3.0%) in most crude oils. However, these compounds are mainly removed during the refining process. They may be recovered as a distillate byproduct during deodorization and are generally referred to as lecithin, which is a mixture of phospholipids. The major phospholipids in crude lecithin are usually PC, PE, PI, and phosphatidic acids. Lecithin is found in many sources of vegetable oils. Commercial lecithin is generally produced from soybean oil during the degumming process. Lecithin is also available from sunflower, rapeseed, and corn oils. These are important surface-active compounds used extensively in the food, pharmaceutical, and cosmetic applications.

Lecithin, being a natural compound and having multifunctional properties, is a logical choice for cosmetic formulations. These preparations include skin creams and lotions, foundations and cleansing creams, sunscreens, soaps, bath oils, shampoos and hair conditioners, shaving creams, preshave and aftershave lotions, nail enamels, face powder, eye color creams, lipstick, and hair sprays. Lecithin can be used as an emulsifier, spreading agent and/or wetting agent, or as a penetration aid, but one of the primary reasons lecithin is chosen for use in cosmetics is its role in providing "skin feel."

Another important reason for using lecithin in cosmetics is the potential for a reduction in skin irritation. Addition of lecithin to cosmetic powders it can reduce irritation of inorganic powders, and it can even form a barrier that prevents these powders from coming into contact with the skin and drying it out. The irritation caused to the skin by soap can be significantly reduced, if not elimi-

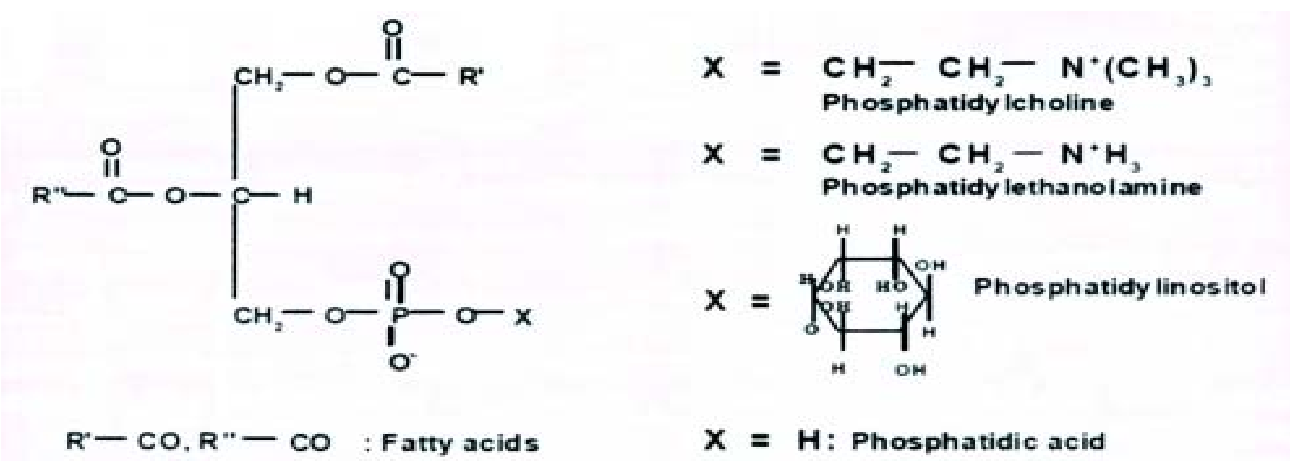

Fig. 1 Molecular structure of Lecithin.

nated, by incorporation of lecithin. In moisturizing cosmetics, lecithin forms highly viscous liquid crystals, the structure of which inhibits the evaporation/transpiration of water from the skin. This moisturizing property extends to keratinized appendages as well. Phos-pholipid incorporation in formulations to treat hair, hooves, horns, claws, and finger and toe nails has proven to be effective at moisturizing and strengthening these same structures.

Lucas Meyer Cosmetics is the world's leading reference for phospholipids - the choice ingredients for the design of the most effective encapsulation solutions. They allow the production of supple nano-vectors to increase the efficacy of both lipo and hydro soluble actives.

Phospholipids are essential components of the structure of all biological membranes. The amphiphilic nature of phospholipids allows them to act a: co-emulsifiers both in O/W and W/C systems and gives them a high capac ity to form liposomes ; they are alsc widely used as dispersing and wettinc agents.

The ability of phospholipids to self organize into bi-layers means tha phospholipid-based emulsifying sys terns can form lamellar structures un der specific conditions. The superposi tion of these layers is biomimetic am very similar to the structure of the skin Products formulated with phospholip ids will thus have a high skin affinity compatibility and tolerance.

Phospholipids give a characterise touch to emulsions : soft and velvet; non greasy and cool. Their film forrr ing property reduces the TEWL an increases the hydration of stratum corneum.

EMULMETIK™ are natural lecithin and phospholipids with various pho: phatidylcholine contents. Used as cc emulsifiers, wetting agents or activ ingredients, they improve all types < formulation with a unique sensorial an natural approach. They can allow th formation of liposomes under specifi conditions.

(Courtesy : SOAPS. DETERGENTS & TOILETRIES REVIEW, MARCH 2012).

THIS IS IT !

Cosmetics from Castor Oil

DR. S. G. BHAT
Consultant - Technologist,
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INDIA is the world leader in the production and export of castor oil and its derivatives. Castor oil has several applications in industrial products, which include pharmaceuticals, oleochemi-cals and cosmetics. Among the vegetable oils of Indian origin, castor oil is unique because of its high viscosity due to high content of Ricinoleic acid as the major fatty acid. This fatty acid contains a hydroxyl group with one single bond. Hence, one can take advantage of this oil to produce value added products used in cosmetics.

LIPSTICKS

Cosmetic grade castor oil is the major ingredient of lipstick formulations due to its ability to keep in suspension inorganic colours and pigments. Inspite of making several attempts, no one has succeeded in substituting castor oil in lipsticks. It is a good base for retention of fragrance added to lipsticks, along with other ingredients.

SHAMPOO

If one needs shampoo to be made from a natural vegetable oil, potassium soap of castor oil has good cleansing properties, but poor lather, which could be supplemented by admixture with potassium soap of coconut oil. The perfume used could be derived from a herbal source, resulting in a Herbal Cosmetic.

There is a trend now-a-days to use natural products and there is ample scope for this type of shampoo against one with surfactants from a synthetic source. It is not popular at present due to high costs of vegetable oils and as synthetic surfactants are comparatively cheaper.

Similarly, liquid soaps could be made using castor oil, if cheaply available, with the above ingredients.

TOOTH PASTE

Before synthetic surfactants like sodium lauryl sulphate, sodium lauryl ether sulphate was commercialised, sodium sulpho ricinoleate was used in tooth pastes as a cleaning agent. The product was imported 50 years ago under the brand name of 'BINACA' and was very popular with the consumer then who could pay the price.

There is a trend all over the world to use natural ingredients even in oral products like tooth paste. One can re-introduce sodium sulpho ricinoleate derived from castor oil.

One can even study this material in detail for various derivatives of sulpho-ricinoleate by trying to neutralize with milder alkalis like triethanolamine, mono or diethanolamine. There is need for research in this direction.

HAIR OIL

The market for hair oil is unlimited in India. Castor oil, as such, may be too viscous and hence mixed with other vegetable oils, which reduces the viscosity suitable for application as hair oil. Bureau of Indian Standard have adopted standard for cosmetic grade hair oil with mixture of vegetable oils, and castor oil could be one of the ingredient. The required quantity of fragrance and colour can be added to make popular hair oil.

Just like iso-propyl myristate/palmi-tate used in cosmetics as a binder, one can make isopropyl esters of castor oil, which can be used directly as hair oil. Research & development is needed in this direction for use of this product in hair care.

Castor oil is unique to India, and only Indians have to be interested in this study so that one can make value added products from castor oil. In large scale production, one can recover valuable glycerine from castor oil, as a by product. There is need to develop new uses for castor oil and hence this approach.

There are other popular esters of castor oil, which have emollient properties. These are cetylrincinoleate, cetyl acetyl ricinoleate, propylene glycol ricinoleate, glyceryl triacetyl hydroxyl stearate and octyl hydroxyl stearate.

EMULSIFIERS

In cosmetics, one requires several emulsifiers and in this connection ethoxylated castor oil is popular and already a commercial product. These are good for fragrance stability in cosmetic creams and lotions.

PERFUMERS

Perfumers in the form of fragrances is an essential ingredient of cosmetics. The raw materials of perfumes are natural materials or synthetic materials.

Castor oil can be cracked or by destructive distillation to give perfumery raw materials like heptaldehyde and undecylenic acid. In fact, castor oil exported from India is converted into these value added products. Hence, it is better that we do the value addition of castor oil instead of exporting the oil as such. Undecylenic acid is a very useful perfumery chemical. The disinfection properties of undecylenic acid has fun-gicidal and bactericidal properties and finds application in the treatment if athletes foot and dandruff.

Starting with Heptaldehyde one can derive perfumery chemicals like Dhydrojasmone, Methyl hexyl ketone, Heptyl, heptanoate, Methyl nonenoate, Gamma-maralactone, Heptanol and Amyl cinnamic aldehyde. Similarly starting with Undecylinic acid one can derive Muskone, 12-oxa hexadecano-lide Undecalactone, Alcohols, Aldehydes and Methyl, Ethyl and Allyl esters. There is a tremendous scope to perfect and develop value added products of castor oil in India, as we have talented technical manpower and raw material which is a renewable material. Hence, efforts should be made to grow more castor oil and make value added products thereof.

(Courtesy : SOAPS. DETERGENTS & TOILETRIES REVIEW, MARCH 2012).

"SMOKE IT OUT"

Sustainability watch

RESEARCHERS at the University of Southern California are reporting the discovery of an improved method for removing carbon dioxide—the major greenhouse gas that contributes to global warming—from smokestacks and other sources, including the atmosphere itself. Their work reportedly achieves some of the highest carbon dioxide removal capacity ever reported for real-world conditions where the air contains moisture.

Alain Goeppert, G.K. Surya Prakash, chemistry Nobel Laureate George A. Olah, and colleagues explain that controlling emissions of CO, is one of the biggest challenges facing humanity in the 21st century. They point out that existing methods for removing CO2 from smokestacks and other sources, including the atmosphere, are energy intensive, do not work well, and have other drawbacks. In an effort to overcome such obstacles, the group turned to solid materials based on polyethylenimine, a readily available and inexpensive polymeric material.

Their tests showed that these inexpensive materials achieved some of the highest CO2 removal rates ever reported for humid air, under conditions that stymie other related materials. After capturing CO,, the materials give it up easily so that the CO2 can be used in making other substances, or permanently isolated from the environment. The captured material then can be recycled and reused many times over without losing efficiency. The researchers suggest the materials maybe useful on submarines, in smokestacks, or out in the open atmosphere, where the materials could clean up CO2 pollution that comes from small point sources such as cars or home heaters, which represent about half of the total CO2 emissions related to human activity.

The research appears in the Journal of the American Chemical Society (doi:10.1021/ja2100005, 2011).

(Courtesy : inform March 2012, Vol. 23 (3)/147).

"INDIAN LEAD"

Castor oil as biofuel feedstock

EVOGENE LTD., headquartered in Rehovot, Israel, announced in early January 2012 the establishment of a wholly owned subsidiary that will focus on developing seed for second-generation biofuel feedstock. Activities that are being transferred to Evofuel by the parent company are the development and commercialization of castor bean varieties for Brazil as well as the biofuel research and development activities located in Israel.

In a company statement, Ofer Haviv, president and chief executive officer of Evogene, said, "We are reinforced by the progress and results of our castor seed in Brazil and believe that access to Evogene's leading plant genomics capabilities will provide Evofuel with commercial advantages and opportunities...."

Researchers at the Benemerita Univer-sidad Autonoma de Puebla (BUAP; Mexico) are experimenting with producing biodie-sel from oil extracted from castor seeds. According to J. Mendieta Lopez and co-workers (Chem. Eng.J. 178:391-397, 2011), the "castor bush grows everywhere." Biofu-elsDigest.com (tinyurl.com/BfDig-castor) reports that one goal of this project is to produce enough fuel to run the university's transport system. The pilot plant was scheduled to start production in January 2012. The plant is designed to produce up to 72,000 liters of biodiesel daily and will process up to 300 kilograms of castor seeds per hour. The BUAP program includes feedstock cleaning and oil purification aspects.

(Courtesy : inform March 2012, Vol. 23 (3)/147).

“AND NOW NEW SOURCE”

Oil in Biomass : a step-change for bioenergy production?

John Dyer is a research molecular biologist working at the US Department of Agriculture-Agricultural Research Service, US Arid-Land Agricultural Research Center in Maricopa, Arizona. He can be contacted at john.dyer<a ars.usda.gov. Robert Mullen is a professor and university research chair in the Department of Molecular and Cellular Biology at the University of Guelph, Ontario, Canada. He can be contacted at rtmullen@uoguelph.ca. Kent Chapman is a professor of biochemistry and director of the Center for Plant Lipid Research at the University of North Texas in Denton, Texas, USA. He can be contacted at chapmaniaunt.edu.

TO help meet the rapidly growing demand for biofuels, scientists and policy makers envision that a variety of agricultural, municipal, and forest-derived feedstocks will be used to produce “second-generation” biofuels, whereby carbon-rich materials are either fermented to produce ethanol or combusted under oxygen-limiting conditions to produce “syngas” (which can be used to produce a variety of biofuels or chemicals). Alternatively, these same carbon-rich materials can be fractionated to recover energy-dense molecules such as oils from a variety of nonfood sources, including algae (Table 1).

Biotechnology will certainly play an important role in the further development of biofuels because it offers creative approaches to solving some of the most vexing problems associated with biofuels. For example, some of the main challenges for production and use of biofuels are that current agricultural practices simply cannot deliver sufficient amounts at low-enough prices to meet the massive demand. These problems could be addressed, in part, by engineering crops to yield significantly greater carbon and energy content.

Biotechnology offers multiple opportunities to achieve that goal. For instance, plants might be engineered for enhanced cellulose production (and reduced lignin content) for ethanol production. Alternatively, or in addition, crops might be developed to accumulate higher amounts of energy-dense lipids, including vacuole-imported secondary metabolites, cuticular waxes on aerial surfaces, or oils (triacylglycerols) in leaves (see inform 22:631-634, 2011) and other vegetative parts of plants. This latter scenario is particularly attractive because the biomass of (nonseed) aerial parts of plants (e.g., leaves and stems) is generally far greater than the amount accounted for by seeds. As such, a rapidly growing perennial grass, such as Panicum (commonly referred to as switch-grass) orMiscanthus, might be developed with the capacity to accumulate oil in leaves. The harvested biomass could then be used for the recovery of both the oil for biodie-sel and the cellulosic residues for ethanol production. Alternatively, this energy-rich biomass (oil has twice the energy content of carbohydrate on a mass basis) could be combusted to produce syngas or electricity.

In the next section, we highlight new and emerging research that suggests we are in fact moving closer to realizing the potential of increasing the

TABLE 1. Current and potential feedstocks for biofuel production

Source	Fuel type
Corn	Ethanol
Sugarcane	Ethanol
Soybean	Biodiesel
Rapeseed	Biodiesel
Perennial plants on degraded lands	Ethanol/syngas/electricity
Crop residues (e.g., corn stover)	Ethanol/syngas/electricity
Sustainably harvested forest materials	Ethanol/syngas/electricity
Double crops/mixed cropping systems	Ethanol/biodiesel/syngas/electricity
Municipal and industrial wastes	Ethanol/biodiesel/syngas/electricity
Recovery of oils from food industry	Biodiesel
Algae	Biodiesel

amounts of recoverable, renewable energy from bioengineered crop plants.

Biotechnology for producing oils in nonseed plant biomass

Although seeds are the primary site of oil synthesis and storage in plants, there is increasing appreciation that other plant parts can also synthesize and accumulate significant amounts of oil. For instance, the single greatest source of vegetable oil in the world is the oil palm tree, which produces -35% of the world's vegetable oil. Palm oil is obtained from both the seed (palm kernel) and the fleshy fruit tissue (mesocarp) that surrounds the seed and that contains up to 90% oil by weight. Olive oil is similarly derived from the oil-rich mesocarp tissues surrounding the seed. Other pertinent examples of nonseed sources of oils include the "oil firewood" plant Tetraena mongolica Maxim, which contains up to 5% oil in stem tissues (dry weight), and the yellow nutsedge plant (Cyperusesculentus), which contains about 24% (dry weight) oil in underground storage organs known as tubers.

Whereas all of these examples provide precedents for production of oil in nonseed parts of the plant, they also involve specialized organs for oil synthesis and storage. Thus, it would be difficult to engineer this type of oil accumulation process into a biomass crop such as Miscanthus. On the other hand, all plant cell types, including those in leaves and stems, have the capacity to synthesize some oil, specifically triacylglycerols (TAG), and scientists are now trying to exploit this observation to significantly ramp up the amounts of TAG in nonseed plant parts through various engineering techniques. TAG are conveniently packaged into lipid droplets for storage irythe cytosol of cells.

Two general approaches have been explored thus far. The first involves more "global" efforts to reprogram leaves for oil synthesis by modifying the normal actions of DNA transcription factors. Transcription factors are proteins that bind to DNA in order to induce the expression of a gene or suite of genes whose encoded product(s) (e.g., a protein) serve a particular purpose within the cell. Several years ago transcription factors called LECl, LEC2, and WRI-1 were shown to control the expression of genes involved in oil synthesis in developing plant seeds. Remarkably, the ectopic expression of these transcription factors in leaves reprogrammed them for the synthesis of oil, such that not only did TAG oil content increase, / but fatty acids normally found exclusively in seed oils were also present in leaf tissues (Fig. 2, strategy 1). Using transcription factors in this manner, however, is not without its shortcomings, since reprogramming a leaf to become more seed-like can have negative effects on normal leaf struc-

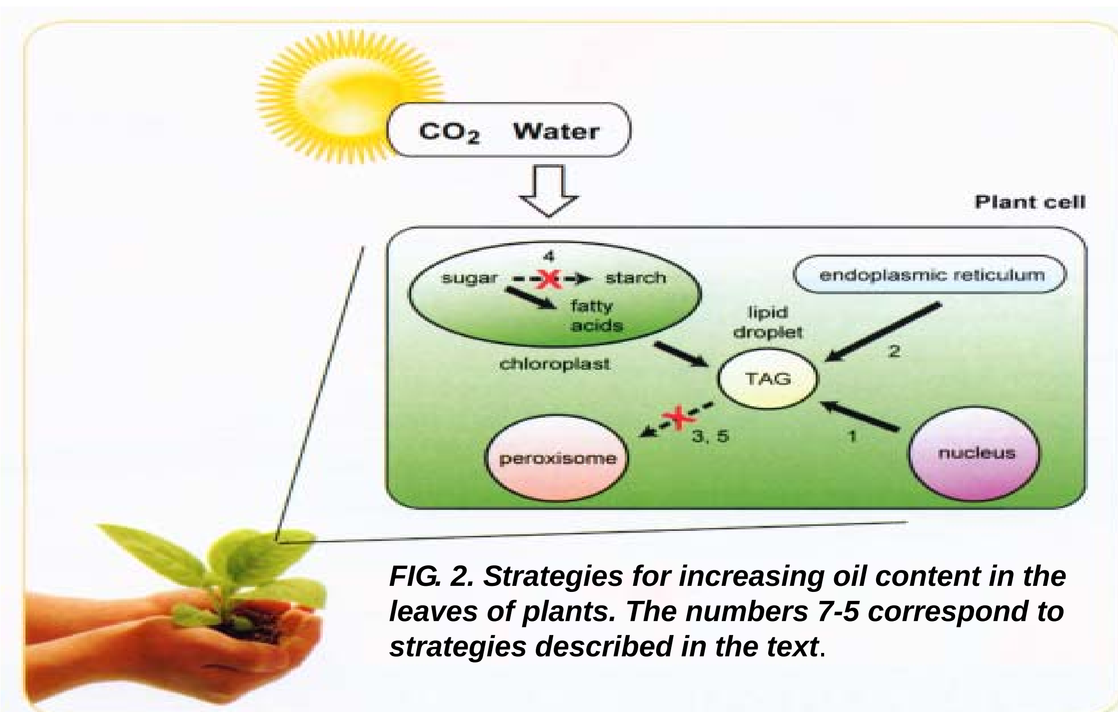

FIG. 2. Strategies for increasing oil content in the leaves of plants. The numbers 7-5 correspond to strategies described in the text.

ture, development, and function.

A second approach to increase oil content in nonseed tissues is to alter fatty acid metabolism in leaves in favor of oil production. For instance, the final step of TAG synthesis is catalyzed by an enzyme called diacylglycerol acyltransferase (DGAT), and multiple studies have demonstrated that over-expression of this often rate-limiting enzyme in developing seeds can boost their oil content by up to 25% (wt/wt). Scientists also have overexpressed DGAT in leaves, resulting in a notable increase in oil content (Fig. 2, strategy 2). In another approach, scientists blocked the ability of plants to break down fatty acids altogether, and this also caused an increase in oil content of leaves under certain growth conditions (Fig. 2, strategy 3). Similarly, inhibition of a key step in starch biosynthesis in plant leaves, to reduce the flow of carbon into starch, also led to an accumulation of TAG (Fig. 2, strategy 4). Lastly, mutating a gene in Arabidopsis (considered to be a model system for studies of plant biology) that regulates multiple aspects of fatty acid metabolism in plant cells, particularly the breakdown and turnover of TAG by peroxisomes (Fig. 2, strategy 5), produced a significant increase in oil content in plant leaves.

Although all of these approaches increase oil content in leaves, greater increases will likely come from combinations of approaches. One study recently reported a 5.8-fold increase in TAG accumulation, with a 9.5-fold increase in energy content in leaves by combining oil-specific transcription factors with a targeted reduction of starch biosynthesis.

Challenges for producing oil in biomass

Significant challenges remain for the use of biofuels as sustain-able alternatives to fossil oil-derived fuels, such as the relatively ' high cost of biofuel production, competition with food-related practices (e.g., arable land and water usage), and the sheer differences in market size between agriculture and energy sectors.

Many technical challenges also remain, including those for producing oil in biomass. Our knowledge of oil synthesis in plant leaves and its regulation is still rudimentary. A significant amount of research is required to understand these processes better, especially in the context of bioenergy production. One example is that the normally low amounts of TAG present in leaf cells are thought to be a transient depot for fatty acids that can either be transferred in and out of cellular membranes or metabolized for energy, depending on the immediate needs of the cell or organism. How then does one "stabilize" the TAG pool so that it will accumulate as a "sink" in leaves, similar to how it accumulates in developing seeds? This might be accomplished by expressing structural proteins from plant seeds called oleosins that normally bind to and stabilize the TAG in specialized lipid droplets. It might also be important to modify the fatty acid composition of leaf-derived oil, which is in polyunsaturated fatty acids and thus might not be ideal for biodiesel production (but should not matter for either syngas production or direct combustion of the plant material to produce electricity).

Clearly, as we begin to understand more about how oils are produced and degraded in plant cells, there will be increasing opportunities to further enhance the energy content in the nonseed tissues of plants.

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(Courtesy : inform March 2012, Vol. 23 (3)/147).

"INDIAN LEAD"

When will aviation biofuel be competitive?

BLOOMBERG New Energy Finance published research to its clients in February forecasting when costs of biofuels for aviation will approach those of conventional jet fuel. The research considered four feedstocks: (i) nonfood vegetable oils, (ii) edible vegetable oils, (iii) woody materials, and (iv) algae (bnef.com/PressReleases/view/188).

If production efficiency continues to improve, the company predicts that by 2018 the cost of biofuels based on nonfood vegetable oils such as jatropha or camelin could be close to that of conventional jet fui (Table 1), which was about $0.85 per liter i early 2012.

With respect to edible vegetable oil: Bloomberg predicts that biofuel made fror oils such as soybean, rapeseed, and palm ma never become fully competitive. As for fuel produced via the gasification of wood and th Fischer-Tropsch process, these are unlikely t< be competitive as aviation fuels until well int the 2020s, according to Bloomberg. And je fuel derived from algae will not achieve cos parity with petroleum-based fuel this decade.

If governments mandate that airline burn a significant proportion of nonfossi fuels before 2020, they will have to subsidiz< these fuels, according to Bloomberg, or elsi introduce mandates requiring carriers to usi a certain percentage of sustainable biofuels ii their mix—and then deal with complaints o rapidly rising ticket prices.

(Courtesy : inform March 2012, Vol. 23 (3)/147).

"BEWARE"

GM crops affect markets in the Indian subcontinent

A

Times by Nidhi Nath Srinivas reviews the effects that introduction of genetically modified (GM) crops in the Indian subcontinent are having or will shortly have on agriculture and markets there (tinyurl.com/GM-crops-India).

Following the introduction of Bf brinjal [egg-plant genetically modified to contain insect-fighting genes from Bacillus thuringi-ensis] in Bangladesh within the next year or so, farmers in the east Indian states of West Bengal and Bihar will see this economically important crop thriving—while Indian farmers fight to keep their plants healthy and productive by using more than a dozen pesticide sprays. And Bangladeshi farmers will earn greater profits from their Bf brinjal. Srini-vas points out: "What are the chances that some Bf brinjal seed will not be 'borrowed' and sown in India? Nil. Such 'borrowing' is commonplace in farming. Farmers routinely exchange seeds with each other." Sharing of such seeds can have measurable impacts on markets and local agriculture.

As another example, Super basmati rice has been grown in Pakistan near the north-western Indian state of Punjab for several years now. Farmers in India liked the variety so much that they started planting it too, even though it was not a government-authorized variety. The Indian government found it could not persuade the farmers to relinquish Super basmati, \so they changed the rules: Super basmati can be legally exported from India as basmati, but the Ministry of Agriculture does not recognize it as a basmati within the country Bf cotton is another case. Although it became available in India in 2002, initially no varieties were approved for use in the northern states. Farmers in Punjab planted the GM cotton anyway, and by 2005 the Indian government had released 60 varieties just for Punjab. So many Pakistani farmers eyed the cotton produced by their Indian counterparts and adopted the seed that the Pakistani government was forced to officially approve it in 2010.

The Economic Times predicts that Indian agriculture can only benefit from serious consideration of the adoption ofbiotech corn, rice, brinjal, and sugarcane.

(Courtesy : inform March 2012, Vol. 23 (3)).

HOW ?

Method for purifying biodiesel fuel

Takanashi, H., Kagoshima University,
US8062391, November 22, 2011

PROVIDED is a method for purifying a biodiesel fuel while completely preventing or greatly reducing generation of wastewater. The present invention relates to a method for purifying a biodiesel fuel characterized by applying an electric field to or heating a crude biodiesel fuel and a method for purifying a biodiesel fuel characterized by adding water (preferably containing a demulsifier such as an inorganic calcium salt or a magnesium salt) to a crude biodiesel fuel to form a W/O [water-in-oil] emulsion and breaking the emulsion by applica_^_ tion of an electric field or heating etc.

(Courtesy : inform March 2012, Vol. 23 (3).

FOOD OR ENERGY ?

ILUC findings on biofuel sustalnability cause alarm

LEAKED documents from the European Commission show that biodiesels from palm, rape/canola and soya have higher total emissions than fossil fuels, and very close to those for Canadian tar sands, reports EurActiv in Belgium. The documents incorporate the controversial indirect land use change (ILUC) (see previous OF/s) considerations in assessing the sustainability of biofuels, they say. Ethanol from sugar beet, sugarcane and wheat have much lower emission levels. The documents suggest, for example, that palm biodiesel has a carbon footprint of 105g of C02/megajoule of energy, compared to 36g for sugarcane and 34g for sugar beet.

At the recent Fuels for the Future trade conference in Berlin in January, both the German federation for bio-energy (BBE) and the federation for oilcrop processors (UFOP) criticised the quality of data being used in current ILUC studies coming out of the commission. They said that the authors of the FPRI study pointed out 25 “uncertainties” and, in addition, have suggested that there are “numerous methodology errors”, for example where acreages and yields differ widely from figures published by the UN’s Food & Agriculture Organisation (FAO).

Last year (see Biofuels News, OF! November 2011), the European Commission said it would delay the introduction of crop specific ILUC measures because of the “scientific uncertainties” surrounding their assessment. When it became apparent that current studies have favoured the ethanol route, Europe’s bioethanol producers called for earlier introduction of crop specific measures, while the biodiesel industry fears that it will be unreasonably penalised so long as serious doubts in the accounting methods prevail. • The US Environmental Protection Agency (ERA) has recently ruled that palm biodiesel fails to meet the US requirement of emitting at least 20% less C02 than diesel from petroleum.

(Courtesy : inform March 2012, Vol. 23 (3).

SAVIOUR !

New Bioplastic era dawns

Global’brands’ are leading*the’push* for’more sustainabie, environmentally-friendly bioplastics, with a new type of bioplastic chemically similar to petrochemicals-derived plastics coming to the fore. Scan Milmo writes

(Courtesy : inform March 2012, Vol. 23 (3).

VEGGIES, BEWARE

How vegetarian are we really ?

Indians are lacto-vegetarians, at best, and definately not vegans

* By Harish Damodaran,
Vishwanath Kulkarni

THE title of this article suggests a certain vagueness about what ‘being vegetarian’ means in the Indian context and how widespread a phenomenon it is within that framework. The National Sample Survey Office’s (NSSO) report on Level and Pattern of Consumer Expenditure, 2009-10, released last month, has enough data to provide insights into the diets of Indians across different States and income classes.

The most striking thing in the data — based on the NSSO's latest quinquennial household consumer expenditure survey carried out during July 2009 to June 2010 — is the inverse correlation that seems to exist between milkand meat consumption. (The NSSO survey considers the quantities actually consumed, whether out of monetary purchases or from home produce valued at the relevant ex-farm/factory rate).

COW BELT

From the accompanying table, it emerges that the States recording the highest average household monthly per capita expenditure (MPCE) on milk and dairy products are also those spending the least on egg, fish and meat.

Take the traditional Vaishnav-Jain-Arya Samaj belt spanning Gujarat, Rajasthan, Haryana and Punjab. The per capita milk spends here are way above the national average, whereas it is just the opposite with regard to so-called non-vegetarian items.

A similar pattern holds for the Hindi heartland of Uttar Pradesh, Madhya Pradesh and Bihar or, to a lesser extent, Maharashtra and Karnataka: While their average milk consumption may be below the all-India levels, they still outstrip corresponding expenditures on egg, fish and meat.

At the other extreme are Kerala, West Bengal, Assam and the North-East States (not shown in the table), which are hardcore non-vegetarian. Equally interesting are Chhattisgarh, Jharkhand and Orissa—States with significant tribal populations that is probably reflected in their high meat consumption relative to the MPCEs on milk, especially in rural areas. Rural households in Andhra Pradesh and Tamil Nadu, likewise, exhibit a preference for what Indians generally refer to as non-vegetarian.

MAHATMAPARADOX

That brings us to the central contradiction in our notions of vegetarianism, highlighted by none other than Mahatma Gandhi. In a typically reflective 1942 monograph titled Key to Health, he drew a distinction between "vegetarian" and "flesh" foods. The latter covered fowl and fish, but not eggs and milk, which were mere "animal foods". However, they "cannot by any means be included in a strictly vegetarian diet".

For Gandhiji, milk and eggs were the same. A layman may view milk as vegetarian food and eggs as flesh food. "In reality, they are not. Nowadays sterile eggs are also produced. The hen is not allowed to see the cock and yet it lays eggs. A sterile egg never develops into a chick. Therefore, he who can take milk should have no objection to taking sterile eggs".

The Mahatma's above conclusion has been liberally interpreted — notably by the National Egg Coordination Committee — as his having endorsed consumption of eggs. The truth is he treated eggs and milk alike, while calling for shunning both.

Declaring that "we are certainly not entitled to any other milk except the mother's milk in our infancy", Gandhiji hoped that an appropriate "vegetable substitute" would be discovered in the future to obviate "the necessity of adding milk to the strict vegetarian diet".

The Father of the Nation's classic 'vegan' line has, nevertheless, found few takers even in regions or among communities steeped in strong anti-meat values. What they have opted for, instead, is a lacto-vegetarian tradition that, far from seeing milk as an unavoidable addition to Gandhiji's "strict vegetarian diet", actually elevates it to the ultimate embodiment of purity and good health.

There is some nutritional underpinning to this view. Animal products (including milk) are rich sources of protein, containing a balanced combination of all essential amino acids that the human body cannot synthesise and have to, therefore, be supplied in one's diet. Plant proteins are, by contrast, incomplete. Even the much-hyped soyabean protein is deficient in the essential amino acid, methionine.

What it means is that the pure vegan route requires a variety of plant protein sources,

AVERAGE MONTHLY PER CAPITA EXPENDITURE IN RUPEES

	Rural India				Urban India			
	Milk*	Meat**	Pulses	Veget	Milk*	Meat**	Pulses	Veget
Haryana	312.18	9.65	33.76	103.44	| 293.36	28.48	44.53	133.59
Punjab	251.76	11.31	43.77	100.85	252.88	21.97	53.59	122.86
Rajasthan	187.91	10.54	22.39	74.30	216.87	24.20	26.02	93.90
Gujarat	133.02	13.94	40.65	97.00	j 188.21	19.32	57.70	131.11
U.P.	82.43	19.89	35.53	81.16	132.98	27.10	42.43	105.32
M.P.	78.10	22.75	37.68	66.80	118.20	28.55	49.24	87.71
Maharashtra	61.36	44.04	50.64	82.56	136.73	75.85	60.79	119.46
Bihar	52.98	38.34	26.53	88.31	90.03	46.06	34.59	97.76
Karnataka	60.91	54.96	40.08	62.12	98.47	75.95	53.44	83.47
A.P.	66.76	80.77	43.86	97.30	114.34	102.70	57.69	110.58
Tamil Nadu	59.58	80.29	45.46	79.76	| 109.67	96.63	58.64	103.29
Chhattisgarh	14.79	32.86	32.22	104.35	62.23	39.56	66.70	153.14
Jharkhand	32.36	47.43	26.74	83.00	I 90.28	76.55	42.94	126.57
Orissa	18.60	50.71	29.58	98.44	! 54.12	80.28	41.71	122.16
Kerala	65.67	159.94	35.29	83.07	! 82.98	172.90	43.25	90.07
Assam	36.15	116.51	30.68	103.92	i 59.81	199.78	42.58	134.01
West-Bengal	25.09	101.91	22.12	100.53	I 65.76	185.92	31.76	124.93
ALL -INDIA	80.55	49.89	35.02	87.33	137.01	71.98	49.12	112.44

* Includes milk products; ** Includes egg & fish
Veget - Vegetables

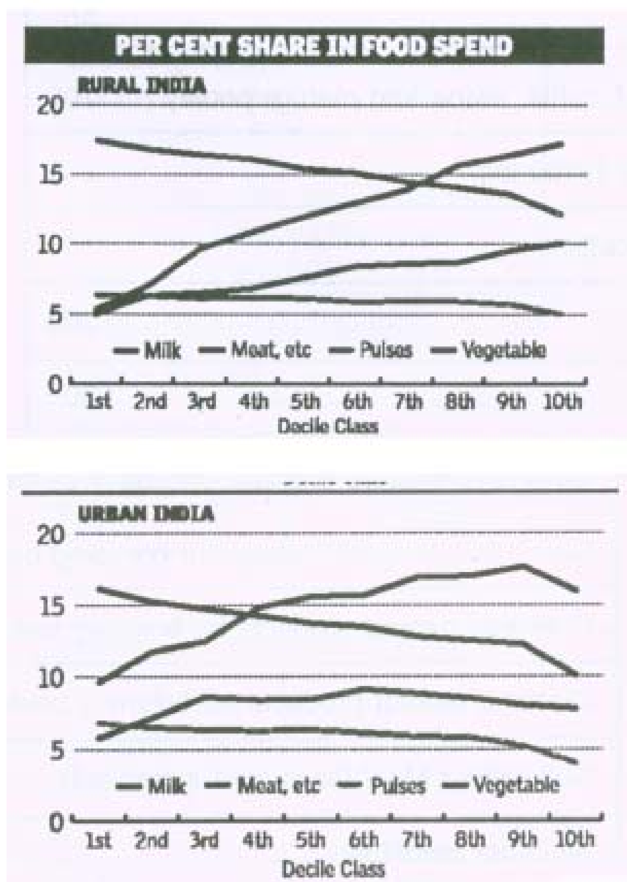
used in the right combination, to achieve the desired amino acid balance. That can be pretty difficult and messy. Why go for it when a more practical lacto-vegetarian alternative is available? So long as you drink milk, you miss little by not having eggs, fish or meat. And that's what the world champion wrestler and a professed vegetarian, Sushil Kumar does — by taking three litres of fresh buffalo milk and a bowl of white butter daily!

NOT BY DAL-SABZI ALONE

While the inverse correlation between milk and meat spends is very well captured in the NSSO data, no such connections are discernable, though, in respect of pulses or vegetables.

The States with relatively high milk and low meat consumption are not necessarily the ones splurging on dal-sabzi. The average MPCE on vegetables is, for example, more in fish-obsessed West Bengal than in Rajasthan. The top slot is, in fact, occupied by Chhattisgarh.

Intake of pulses, on the other hand, displays no great inter-State variability and also shows no negative correlation with expenditure on eggs, fish and meat. The defining factor of 'vegetarian' appears to be only milk: Those who have a lot of it tend to abhor flesh foods. This kind of unambiguous preference, positive or negative, does not extend to pulses and vegetables.



The last point comes out clearly in the charts giving the composition of food expenditure across different deciles of India's rural and urban populations. The poorest or bottom 10 per cent rural consumers allocate just 5.3 per cent of their total food budget on milk, which is below the 6.3 per cent on pulses and 17.4 per cent on vegetables.

But as they get richer, the share of both milk and meat rises, while falling in the case of pulses and vegetables. At the top 10 per cent decile, milk's share surpasses every other food, including cereals (not shown in the charts).

There are obvious policy implications from all this. With increased incomes, Indians diversify their diets away from calories (cereals and sugar) to proteins. That tendency, in turn, engenders the problem of 'protein inflation', to use the colourful expression coined by the Reserve Bank of India. The term is a misnomer.

As our analysis shows, it's not 'protein1 but 'animal protein' that's the real issue.

(Courtesy : SEA News Circular, Vol.XIV, Issue 10, Jan., 2012).

TIME, WE DID IT !

MYCOTOXIN LEGISLATION IN EU AND CANADA

EU Maximum levels for certain contaiminants in foodstuffs
(Commission Regulation 1881/2006) (ppb)

	Aflatoxin B1	Sum of Aflatoxin B1, B2,G1,G2
All cereals and all products derived from cereals, inclusind processed cereal products, with the exception iof maize and rice for sorting/physical treatment and baby/infant food including dietary foods for special medial purposed	2.0	4.0
Maize and rice to be subjected to sorting or other physical treatment before human consumption or use as an ingredient in foodstuffs	5.0	10.0
		Ochratoxin A
Unprocessed cereals		5.0
		Deoxynlvalenol
Unprocessed cereals (other than durum, oats, maize)		1,250
Unprocessed durum wheat and oats		1,750
Unprocessed maize (except for wet milling)		1,750
Cereals intended for direct human consumption		750
		Zearalenne
Unprocessed cereals other than maize		100
Unprocessed maize (except for wet milling)		350
Cereals intended for direct human consumption with exception		75
of those listed below Maize intended for direct human consumption, maize-based snacks and maize-based breakfast cereals		100
		Fumonisins (B1+B2)
Unprocessed maize (except for wet milling)		4,000
Maize and maize-based foods inteded for direct human consumption with exception of those listed below*		1,000
Maize-based breakfast cereals and maize-based snacks		800

*Higher MPLs set for milling fractions of maize

EU Guidance Values for products intended for animal feed

(Commission Recommendation 2006/576) (ppb)

Mycotoxin	Products intended for animal feed	Guidance value ug/kg for feed with 12% moisture content
Deiztbuvalenol	Feed materials	
	- Cereals & cereal products with the exception of maize by-products	8,000
	-Maize by-products	12,000
	-Complementary & complete feedingstuffs with the exception of	5,000
	-Complementary & complete feedingstuffs for pigs	900
	-Complementary & complete feedingstuffs for calves, lambs and kids	2,000
Zearalenone	Feed materials	
	- Cereals & cereal products with the exception of maize by-products	2,000
	- Cereals & cereal products with the exception of maize by-products	2,000
	- Maize by-products Complementary & complete feedinqstuffs	3,000
	- For piglets and gilts	100
	- Sows and fattening pigs	250
	- calves, dairy cattle, sheep and goats	500
Ochratoxin A	Feed materials	
	- Cereals & creeal products Complementary & complete feedingstuffs	250
	- For pigs	50
	- For poultry	100
Fumonisin B1 +B2	Feed materials	
	- Maize and maize products Complementary & complete feedingstuffs	60,000
	- For pigs, horses, rabbits, pet animals	5,000
	- For fish	10,000
	- For poultry, calves, lambs, kids	20,000
	- For adult ruminants (>4 months) & mink	50,000

EU Maximum Levels for products intended for animal feed
(Directive 2002/32/EC) (ppb)

Mycotoxin	**Products intended for animal feed**	**Max Level ug/kg for feed with 12% moisture content**
Mycotoxin	Products intended as animal feed	
Aflatoxin B1	Feed materials with the exception of:	50
	- Groundnut, copra, palm-kernel, cottonseed, babasu, maize & maize products	20
	Complete feedingstuffs for cattle, sheep, goats with the exception of :	50
	- dairy cattle	5
	- calves and lambs	10
	Complete feedingstuffs for pigs & poultry (except young animal)	20
	Other complete feedingstuffs	10
	Complementary feedingstuffs for cattle, sheep, goats (except dairy animals, calves, lambs	50
	Complementary feedingstuffs for pigs & poultry (except young animals)	30
	Other complementary feedingstuffs	5
	Canada (ppb)	

Canada's federal Department of Health has proposed new maximum limits for Ochratoxin A in food similar to those contained in EU 1881/2006, which are still under consultation. Proposed new maximum limits for DON are expected by early 2012. Below are the Maximum Limits (ppb) currently applied in Canada.

	Deoxynivalenoi
Human food	
Uncleared wheat for human consumption	2,000
Animal feed	
Cattle & poultry feed	5,000
Diets for pigs, calves & dairy cows	1,000
	Aflatoxins
Feed stuffs	20
	HT-2 Toxin
Diets for cattle and poultry	100
Diets for dairy animals	25
	Ochratoxin A
Pig & poultry diets	2,000
(Source : gatta World Oct. 2011 issue)	

THE NUCLEAR ATTACK !

Atomic research to play big role in agriculture mooted

BHABHA Atomic Research Centre (BARC) director Ratan Kumar Sinha said here that India had made impressive strides on the agricultural front during the last three decades. Much of the credit for this success should go to the national agricultural research system. Policy support, production strategies, public investment in infrastructure, research and extension for crop, livestock and fisheries have significantly helped to increase food production and its availability, he said.

Referring to the use of radiation in agriculture, Sinha stated that use of radiation and radioisotopes in agriculture is one of the important fields of peaceful applications of atomic energy for societal benefit and BARC has contributed significantly in this area. Radiations and radioisotopes are used in agricultural research to induce genetic variability in crops to develop improved varieties, to manage pests, to monitor fate and persistence of pesticides, to study fertiliser use efficiency and plant micronutrient uptake and also to preserve agricultural produce, he elaborated.

Delivering the 25th convocation address of 2012) role in agriculture mooted the University of Agricultural Sciences (UAS) held at Dharwad, he said, agriculture and allied sectors have grown at an estimated rate of 3.5 pc during the 11th Plan, compared to the 2.4 pc during the 10th Plan.

"However, we need to double our efforts to ensure that 4 per cent average growth is achieved in the 12th Plan Period. This calls for a Second Green Revolution which is more broad-based, more inclusive and more sustainable. The time is ripe to produce more without depleting our natural resources any further, and look towards agricultural scientists for ushering in this Green Revolution, he asserted.

It is estimated that to meet the demands of increasing population, India will need over 345 million tonnes of foodgrain by 2030, surmounting impeding factors like reduced land for farming, shortage of water and increasing costs of inputs. Research on rainfed and dryland farming and adoption of public-private-partnership should take driver's seat in the 12th plan. Entire agricultural scientific community will have a challenging task to achieve this, he observed. (Source: Business Standard dated 6th March 2012).

(Courtesy : SEA News Circular, Vol : XIV, Issue: 12, March, 2012).

INTERESTING

Refining of Rice Bran Oil by Neutralization with Calcium Hydroxide

THE applicability of calcium hydroxide (lime) in the neutralization of rice bran oil (RBO) was investigated. Crude RBO samples of three different free fatty acids (FFA) (3.5-8.4 wt%) were degummed, dewaxed, bleached, and neutralized with lime and deodorized. The oils obtained thus were characterized by determining the color, peroxide value (PV), content of unsaponifiable matter (UM), and FFA. Conventionally practiced caustic soda neutralization (at 80-90°C) of FFA has in the present investigation been replaced by a high-temperature (150-210°C) low-pressure (2-4mm Hg) reaction with lime. It was observed that neutralization with $Ca(OH)^2$at high temperature (210°C) and underlow pressure (2-4mm Hg pressure) may substantially reduce the FFA content (0.8 wt%, after 2 h). The deodorized oil was found to be of acceptable color, PV, and content of UM and FFA. Neutralization of oil was also carried out by using NaHCO3 and Na2CO3 nonconventional alkalies for neutralization, and the results were compared with NaOH and Ca(OH)2.Overall recovery of oil in Ca(OH)2 refining process (88.5 ± 0.6 wt%, for Sample 1 containing 8.4 wt% FFA) was found to be more than other competitive processes studied. - De, B.K, and J.D. Patel, Eur. J. Lipid Sci. Technol. 113:1161-1167, 2011. (Source : AOCS Journal Jan 2012.

(Courtesy : SEA News Circular, Vol : XIV, Issue: 12, March, 2012).

MORE ABOUT IT

ICAR forms panel to unravel mystery of Monsanto gene in 'indigenous' Bt Cotton

THE Indian Council for Agricultural Research (ICAR) will set up an expert committee to look into patent violation issues concerning Bikaneri Narma, which was claimed to be the country's first indigenous public sector-bred Bt cotton (genetically modified) seed variety.

Bikaneri Narma Bt Cotton also promoted as 'completely indigenous Bt variety' was developed by Central Institute for Cotton Research (CICR), Nagpur, and University of Agricultural Sciences, Dharwad, along with Indian Agricultural Research Institute (IARI). However, the variety was actually found to have a Bt gene originally patented by US farm product multinational Monsanto.

According to ICAR director general S Ayyappan, the variety has been withdrawn from market since 2009 to stop the production of these 'indigenous' GM cotton seeds after the report of patent violation.

"We are going to set up a committee to look all aspects of the patent violations and also scientifically find out the flaws in the entire process, Ayyappan told FE.

Meanwhile, civil society groups have become vocal in their demand for a moratorium on research on all transgenic crops in ICAR-affiliated institutes.

"In effect, the Indian biotechnologists, supported with enormous amounts of taxpayers' money, doing research on developing indigenous 'biotechnology products' have misled the nation by passing off the Monsanto technology as their own," the coalition for a GM-Free India said in a statement.

"This episode shows that the government-owned scientific establishment and regulators are not to be completely trusted on the issue of research and development," Alliance for Sustainable & Holistic Agriculture convenor Kavitha Kuruganti said.

Bikaneri Narma was released for farmers as BN Bt by CICR in 2009 and was termed as an indigenous Bt variety that is distinct from the Monsanto hybrid where farmers have to buy new seeds each season. Farmers could reuse BN Bt for many years.

In April 2008, during deliberations in then Genetic Engineering Approval Committee, the GEAC members initially approved large-scale field trials for BN Bt and then in a meeting next month, reviewed the decision and gave approval for the commercialisation of the seed without any field trial.

The rationale was that since the seeds of BN Bt could be saved by farmers, a large scale field trial is tantamount to commercial release. However, after a short time of its much publicised release in 2009 BN Bt was withdrawn from the market without any explanation and no reports were made available about its performance till then.

India, the world's second biggest cotton producer, is heading towards harvesting a record 35.9 million bales of 170 kg each in the 2011-12 season (October-September), mainly attributed to BT cotton seeds. Over 80% of the total cotton acreage is under Bt crop in the country. The Bt cotton variety was developed using a gene - CryIAC - derived from soil bacterium Bacillus thuringiensis, which makes the crop resistant to pink boll worms.

(Courtesy : AICOSCA Newsletter, January 2012).

WHOA !

Cloth made from coloured cotton

THE University of Agricultural Sciences, Dharwad, may soon have cloth made from coloured cotton. The University has now perfected growing cotton, which is not genetically modified, with natural dark brown, light brown and green colour after almost a decade's research. This could cut the cost of processing for garment manufacturers by more than half, while also ensuring that pollution is not caused by dyeing.

Coloured cotton can now be commercially cultivated in the country. The US and Europe have already developed coloured cotton and clothes too are available.

Initially, the Dharwad varsity had spun cloth out from a single colour cotton, that is either dark brown, light brown or green. But now, it has made cloth that has been made from yarn of white, brown and green cotton.

(Courtesy : AICOSCA Newsletter, January 2012).

CONTRA

Area under cultivation of Bt. Cotton to be around 94 lakh hectares in 2011-12

BT. COTTON is the only crop approved for commercial cultivation in nine states by Genetic Engineering Appraisal Committee (GEAC). The area under Bt. cotton is targeted to be around 95.04 lakh ha for the year 2011-12.

The findings of laboratory and field studiesInstitute for Cotton Research (CICR), Nagpur showed that Bt. cotton was toxic to bollworms but did not have any direct effect on any of the non- targeted beneficial insects and was also nontoxic to birds, fish, cow, goat and soil microorganisms. Studies conducted by CICR showed that Bt. Cotton has been playing a major role in effectively protecting the crop from bollworms, especially the American Bollworm, Helicoverpa armigera, thus preventing yield losses. The biggest gain from the technology was in the form of reduced insecticide usage from 46% in 2001 to less than 26% after 2006 and 21% during the last two years 2009 and 2010. The introduction of Bt. cotton hybrids has helped in production increase from 156 lakh bales (170kg lint per bale) in 2001 to an estimated 356 lakh bales in 2011. Bt. cotton was introduced in 2002 and the area increased from 0.29 lakh hectares in 2002 to 95.04 lakh hectare in Kharif 2011(target). The productivity was 309 kg per hectare in 2001 before the introduction of Bt. cotton which increased to 495 Kg/ha in 2010.

Studies conducted by CICR showed that there was enormous farmer support for Bt. cotton as is evident from the fact that more than 90% of the area in all the cotton growing states in India is now under Bt. cotton. Maximum gains in yield increase have been obtained in Gujarat, Andhra Pradesh, Maharashtra, Haryana, Punjab and Tamil Nadu. There have been a few stray reports of opposition to the technology from NGO groups, but these have had a minuscule impact on the spread of Bt. cotton in India. Farmers are being constantly educated by CICR, State Agricultural Universities, Krishi Vigyan Kendras through front line demonstrations and training programmes on all aspects pertaining to GM crops, its bio-safety and suitable methods for harnessing sustainable benefits through appropriate crop production technologies.

(Courtesy : AICOSCA Newsletter, January 2012).

"LOOK OUT"

Area under cultivation of Bt. Cotton to be around 94 lakh hectares in 2011-12

HYDROGEN - a colourless, odourless gas is increasingly gaining attention as a future source of energy free from environmental pollution. Its new use has been found in the automobile and power generation sector. The biggest advantage with hydrogen is that it has the highest energy content per unit mass among known fuels and it burns to produce water as a by-product. It is, therefore, not only an efficient energy carrier but also an environmentally benign fuel as well. In fact, the Ministry of New and Renewable Energy have been supporting a broad based research, development and demonstration (RD&D) programme on different aspects of hydrogen energy for over two decades. Consequently, a National Hydrogen Energy Road Map was prepared in 2005 which provides for various pathways for development of hydrogen energy i.e. production, storage, transport, safety, delivery and applications. However, the current technologies for use of hydrogen are yet to be optimized and commercialized but efforts for the same have already started.

Hydrogen Production

Hydrogen is found only in combined state on earth and therefore its production involves the process of its isolation from its compounds, a process which itself requires energy. Globally, about 96% of hydrogen is produced presently using hydrocarbons. About 4% hydrogen is produced through electrolysis of water. Refineries and fertilizer plants are major in-situ producers and consumers of hydrogen in India. It is also produced as a by-product in chloro-alkali industry. Hydrogen production falls into three categories: thermal process, electrolytic processes and photolytic processes. Some thermal processes use energy resources while in others heat is used in combination with closed chemical cycles to produce hydrogen from feedstocks such as water.

These are known as “thermo-chemical” processes. But this technology is in early stages of development. Steam Methane Reformation, gasification of coal and gasification of biomass are other processes of production of hydrogen. The advantage with coal and biomass is that both are locally available resources and biomass is a renewable resource too. Electrolytic processes use electricity to split water into hydrogen and oxygen and can even reduce the emission of green house gases emission if the source of electricity is ‘clean’. Hydrogen Storage.

Hydrogen storage for transportation is one of the most technically challenging barriers to widespread commercialization of this technology. The most common method of storage is in gaseous state in pressurized cylinders, however, it being the lightest element requires high pressures. It can be stored in liquid form in cryogenic systems but would require high amounts of energy. It is also possible to store it in solid state in the form of metal hydrides, liquid organic hydrides, carbon nanostructures and in chemicals. The Ministry of New and Renewable Energy is presently supporting R&D projects in this field.

Applications

Apart from using it as a chemical feedstock in industry, it can also be used as a clean fuel in automobile and also for power generation through internal combustion engines and fuel cells. In the field of hydrogen in internal combustion engines, R&D projects for using hydrogen blended compressed natural gas and diesel and development of hydrogen fuelled vehicles are being implemented in India. Hydrogen fuelled motorcycles and three wheelers have been developed and demonstrated in the country. Catalytic combustion cookers using hydrogen as fuel have also been developed. The Banaras Hindu University, BHU has modified commercially available motorcycles and three wheelers to operate on hydrogen as fuel. With a view to provide hydrogen blended compressed natural gas as an automotive fuel, a dispensing station for the same has been set up at Dwarka in New Delhi with partial financial support from the Ministry.

This facility provides CNG fuel blended with hydrogen up to 20% in volume in demonstration and test vehicles. A development cum demonstration project for use of H-CNG as fuefTrrselle^t vehicles (buses, cars and 3-wheelers) is also under implementation. Besides, hydrogen fuelled generator set is being developed by BHU and IIT, Delhi. Another application of hydrogen energy is the fuel cell, an electrochemical device converting chemical energy of hydrogen directly into electricity without combustion. It is a clean and efficient process of electricity generation. It can be used in UPS systems, replacing batteries and diesel generators. In view of the relevance of fuel cells in automobiles and power generation, several organizations globally are pursuing RD&D activities in this field. Portable applications are also being developed. The present efforts in these fuel cells are focused on reducing its cost and improving its durability. The focus of the Fuel Cell programme of the Ministry of New and Renewable Energy has been on supporting RD&D activities ondifferent types of fuel cells.

(Courtesy : Business Empire, January 2012, Pg 44).

“RAGS TO RICHES”

Deriving Energy from Waste

URBANIZATION and industrialization- the two facets of development are becoming the cornerstone of all developing countries and much the same is true for India. Though the two sound encouraging, but bring in the problem of enormous generation of wastes. In fact, the problem is gaining greater currency as these wastes are becoming sources of pollution. Most wastes that are generated find their way into landfills and water bodies. Significantly, these are disposed off without proper treatment and hence emerge as sources of green house gases like methane and carbon dioxide. The solution to it lies in the practice of treating the wastes before disposal and using it in the production of energy. It would be a two-pronged approach wherein not only the waste would be rendered environment friendly thereby mitigating pollution but at the same time generate a substantial quantity of energy so essential for meeting developmental needs. There are various procedures through which energy from waste can be generated. Biomethanation.

First and foremost is Anaerobic Bigestion or Biomethanation. In this process, the organic waste is segregated and fed into a biogas digester. The waste undergoes biodegradation under anaerobic conditions to produce methane rich biogas. The so produced biogas can be used for cooking, heating, generating electricity etc. The sludge can be used as manure depending on the composition of the input waste.

Combustion/Incineration

The next procedure is Combustion/Incineration which is direct burning of wastes in the presence of excess air (oxygen) at high temperatures (about 800C). It results in conversion of 65%-80% of heat content of organic matter into hot air, steam and hot water. The steam generated can be used in steam turbines to generate power. Pyrolysis/Gasification

Pyrolysis/Gasification is another process of chemical decomposition of organic matter through heat. The organic matter is heated in the absence or restricted supply of air till it breaks down into smaller molecules of gas (known collectively as syngas). The gas so produced is known as producer gas which constitutes carbon monoxide (25%), hydrogen and hydrocarbons(15%), carbon dioxide and nitrogen(60%). The producer gas is burnt in internal combustion (1C) generator sets or turbines to produce electricity.

Landfill Gas Recovery Landfill Gas Recovery is another measure of recovering gas from waste dumps wherein the waste slowly decomposes to produce 'Landfill gas'. This gas consists of high percentage of methane (approx.50%) and has a high calorific value of about 4500kcal/cubic metre and hence can be used for heating cooking and generating power. Plasma Arc.

Plasma Arc is a relatively new technology for disposal of wastes, particularly, hazardous and radioactive wastes. Since it involves nearly complete destruction of waste while producing energy, it is less polluting. It does not produce oxides of nitrogen and sulphur and makes toxic ash left in the process easier to handle. However, the technology is costly and has not been tried in India. Advantage of Using Waste for Energy Another significant advantage of using waste for energy is reduction in the demand for landfills in land scarce cities. The cost of transportation of wastes is also reduced. In some cases, it can produce fertilizer as a by- product. But, on the flip side, the technologies are at present often expensive and even imported in India. The approximate cost per MW for waste to energy projects based on different technologies is high. While for Biomethanation, it ranges between 6-9 crores, for Gasification and Combustion, it is in the order of 9-10 crores. However, there is a financial support provided in the scheme ranging from 20 lakhs to 3 crores.

It is estimated that there is a potential of generating 3600MW of power from urban, municipal and industrial wastes in the country and it is likely to be increased to 5200MW by 2017. It can be set up by the urban local bodies, government as well as participation by the private developers. At the end of February, 2012 the cumulative achievement of grid interactive power from waste was 36.20 MW in urban sector and 53.46 M W in industrial sector. In off-grid/ captive power cases the cumulative achievement of waste to energy capacities was 3.50 MWeq for urban sector and 90.15 MWeq for industrial sector. The Ministry of New and Renewable Energy is encouraging such feats to bring in an era of sustainable development by deriving energy through wastes.

(Courtesy : Business Empire, January 2012, www.businessempire.in,)