

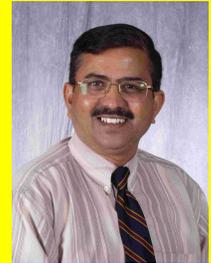


Central Institute of Post Harvest Engineering and Technology, Ludhiana

Our Slogan: Produce, Process and Prosper

CIPHET E – Newsletter for January, 2007
Vol. 2 No.1

Director's Column



Dear All,

This is an age of information technology and I am glad to announce that CIPHET has started its use for conducting virtual training programmes. We have a state of the art facility for video conferencing through satellite with two dedicated ISDN lines. We wish to use this facility to reach upcoming agri business entrepreneurs for transfer of CIPHET developed technologies. This facility can also be used for conducting virtual conferences and seminars among scientists as well as faculty of SAU's and Institutes where matching facility is available. Hence I wish to appeal to those having similar facility to please contact Dr. Meena from CIPHET (Mobile 9417531083) so that we can make these linkages operational. Another important medium through which research can be effectively passed on to end-users is print and electronic media. Hence we organized meet the press event at CIPHET on Dec 16, 2007 and wish thank media personnel for their wholehearted support.

At CIPHET we believe in the consortium approach of solving the problems, be it of research or transfer of technology. We have active collaboration with NRC on Makhana to upgrade rural level processing technology and CIPHET designed machines are being manufactured by local fabricator in Bihar which will be tested for their efficiency and effectiveness by NRC Makhana. Another collaboration is our proposed involvement in NAIP project on "Livelihood Improvement and Empowerment of Rural Poor through Sustainable Farming Systems in North East India" led by ICAR Research Complex for NEH Region, Barapani.

I feel proud that CIPHET scientists are being recognized for their R&D efforts and one among them is Dr. Goyal who has been awarded DR. Bhargava Medal of Bioved Research Society at Allahabad on Jan 29, 2007.

The livestock play an important role in the agrarian economy of India because of small land holdings and a large percentage of rural landless. Dairying is an important source of subsidiary income for them. Our livestock are generally poor producers because of poor feed and management and tropical heat and diseases. With this background, in this issue we have given project profile of cattle feed manufacturing plant.

With best regards.

R.T. Patil
Director

Events:

1. CIPHET Established Networking through Cyber Air Corridor



Central Institute of Post Harvest Engineering & Technology had face-to-face technical discussion with Punjab Agricultural Management & Extension Training Institute (PAMETI) through video conferencing on Jan 25, 2007. Director CIPHET gave informative lecture about technologies of CIPHET and Entrepreneurship Development Programmes (EDPs) in Post Harvest Engineering and Technology. Dr. S. P. S. Brar, Director, PAMETI, Ludhiana explained about need based training programmes, extension activities, evaluation and role of Agricultural Technology Management Agency (ATMA) in execution of the rural development projects. Director CIPHET answered the queries of trainees and staff of the PAMETI. CIPHET is planning to connect all the training institutions and Krishi Vigyan Kendra (KVK) through video-conferencing for speedy transfer of post harvest technologies.

2. CIPHET - PRESS MEETING

An Institute-Press meet was organized at CIPHET, Ludhiana to inform how CIPHET can help the farmers, agri entrepreneurs, industry and other stakeholders especially in the post-harvest utilization aspects. Director enlisted and explained all the technologies developed at CIPHET, Ludhiana and are ready for commercialization. Representatives of local as well as national print

and electronic media attended this meeting. The queries of the journalists related to how post harvest research could be useful tool for crop diversification and improving the income of the farmers were answered.



3. Dr. S. N. Jha visited NRC for Makhana

Dr. S.N. Jha, Sr. Scientist visited the Research Centre for Makhana under ICAR, RC, Patna for a collaborative project on Post – Harvest Technology of makhana. Design of roasting and popping unit for makhana was discussed and given to private entrepreneur for fabrication.

4. Dr. D. Dhingra visited ICAR Research Complex, Barapani and Ernakulam

- i. Dr D Dhingra attended the interaction workshop as a partner for developing full proposal on “Livelihood Improvement and Empowerment of Rural Poor through Sustainable Farming Systems in North East India” on 9th January, 2007 at ICAR Research Complex for NEH Region, Barapani. The activities of CIPHET, (what CIPHET can offer) objectives and work plan related to CIPHET were presented. The brief presentation evoked keen interest among all partners. The lead centre was interested in associating CIPHET as a partner in the project, as post harvest technology is an important component of the project for livelihood security and sustainability.
- ii. Dr D Dhingra delivered lectures on (i) modern trends in agricultural processing, (ii) world trade organization and Indian agriculture, (iii) project preparation and (iv) productivity improvement, to the participants of six day refresher course for senior officers of the Department of Agriculture on “Project preparation and project appraisal techniques’ at Ernakulam, Kerala on January 1, 2007. Twenty officers attended the training course from the Department of Agriculture, Kerala. State Horticulture Mission sponsored the program and was organized by KITCO Ltd. Kochi.

5. Participation of CIPHET scientists in National Convention of Agricultural Engineers

Dr. R. T. Patil, Dr. OD Wanjari, Dr D. Dhingra and Er Sangeeta Chopra attended 20th National Convention of Agricultural Engineers and National Seminar on Farm Mechanization for Diversification of Agriculture during January 19-20, 2007 at PAU Ludhiana. Dr. Patil chaired the sessions on “Agri-business as diversification of agriculture” and “Role of information technology in agriculture” in which emerging technologies and latest concepts and efforts of marketing agricultural produce were discussed.

6. Training Programme at CIPHET

A training program on post harvest technology was organized for 18 participants from Assam during 22nd January to 30th January. The participants belonged to the NGO's and SHG's. State Institute of Rural Development, Guwahati, Assam, sponsored the training program. The participants were accompanied by Mr Surajit Bor Gohain, Faculty Member, Service Sector, SIRD. The training covered theory and practicals on milling of cereals, pulses, oilseeds, processing of tapioca, handling and packaging of fruits and vegetables, value addition of fruits and vegetables, food safety and quality, food microbiology etc. The participants were also appraised about the technologies developed at CIPHET Ludhiana and under post harvest technology scheme (AICRP on PHT). In addition to theory and practicals field visits to Markfed Canneries, Nijjer Horticulture Ltd. and rice mills in Jalandhar and Amritsar.



Group photograph of the participants from Assam with the scientists of Division of Transfer of Technology

7. Republic Day Celebration

On the occasion of Republic Day on 26th January 2007, Dr R T Patil hoisted the national flag in the presence of Dr O D Wanjari, Dr S K Nanda, Dr D S Uppal, Sh Tej Ram and other scientists and staff of CIPHET and addressed the gathering. Dr Patil stressed about developing entrepreneurship in the society at all levels and CIPHET employees took the pledge to develop courage to take important and honest decisions for institute, society and the country as suggested by Honorable President of India in his presidential address. Sports events were arranged for children up to 15 years of age. In the end musical chair was organized for the ladies. The agro-processing centre CIPHET arranged popcorns for all the guests. Similarly Republic Day celebration was held at CIPHET campus Abohar where they also participated in a republic day parade with a scaled down model of Kinnow processing plant.



8. CIPHET- SISI Awareness Programme: - 8 Jan 2007

One day awareness camp for upcoming entrepreneurs for establishing food processing industries was organized at CIPHET Abohar in collaboration with SISI, Ludhiana. About 60 participants from DAV College, Abohar, G.N. Khalsa College, Abohar, NITCON trainees and farmers from Vill. Bhagser, Vill. Panj Kosi, Vill. Ramsure, Abohar participated in this programme. The opportunities in food processing sector were emphasized. The information on various entrepreneurship development programmes planned by CIPHET was given alongwith the technologies developed by CIPHET in technical session. Other dignitaries in inaugural session were Mr. N.S. Brar (SDM, Abohar), Professor J. L. Aggarwal, Commerce Deptt., DAV College and Mr Kundan Lal, Assistant Director, SISI. In the technical session the lectures delivered were by Mr. Kundan Lal, Assistant Director, SISI, titled "SISI new policies and their promotion for development of agro based industries"; then by Sh. C.M. Giridhar, Mktg. Officer, DMI, Abohar

on “Market strategies of agro based value added product” and by Mr. Prince Gandhi, Consultant, NITCON on “Role of NITCON in agro based entrepreneurship development”.

9. CIPHET Participation in Bioved Congress

Dr. R.K. Goyal and Dr. R.K. Gupta participated in 9th Agricultural Scientists and Farmers’ Congress organized by Bioved Research Society at Vigyan Parishad, University of Allahabad from 29 to 30th January 2007. The executive committee conferred its Dr. S. R. Bhargava Medal-2007 to Dr. R. K. Goyal, Senior Scientist, for his outstanding contribution in the field of Agricultural Structure and Process Engineering.



10. CIPHET Scientists Participated in ISAE convention

Dr. R.T. Patil, Director and Vice President, ISAE, Dr. S.K. Nanda. PC(PHT), Dr. O.D. Wanjari, PC(APA), Dr. S.N. Jha, Dr. K.Narsaiah and Dr. D.R. Rai, all Sr. Scientist participated in 41st ISAE Annual Convention held at JAU, Junagarh during January 29-31, 2007. The CIPHET scientists actively participated in the proceedings of the convention by presenting 4 papers and by chairing and rapporteuring for the technical sessions.

11. Visit to Rampur Village, Ludhiana

Dr. R.T. Patil, Director visited Gurudwara in Rampur village in Ludhiana district on 24 January 2007 and addressed the gathering of farmers. He emphasized need of minimal processing in production catchments and highlighted its benefits. The gurudwara management was very receptive to the idea of starting such processing and value addition activity to the crops grown in their farms as well as grown by nearby farmers.



12. Kinnow show/seminar

A kinnow show/seminar was organized by Punjab Horticulture Department in collaboration with CIPHET on 24 January, 2007 at CIPHET campus Abohar. Various orchard owners of District Ferozepur displayed various exhibits of kinnow fruits. Dr. Kulbir Singh, Director Horticulture Punjab Government was the Chief Guest and Dr. D.B. Singh Incharge CIPHET, Abohar and Dr. P.S. Aulakh Director Research Station PAU, Abohar were guest of honour of the day. Among participants the various awards were also given to best exhibits. In the technical session Dr. D.B. Singh gave technical lecture on post harvest management of kinnow. He emphasized that in order to reduce the post harvest losses in kinnow scientific and effective management practices at farm and during storage, transportation and processing is very much needed. Dr. P.S Aulakh Director Research Station described the importance of quality planting material and pre-harvest operations in carried out. Dr. T.S. Thind gave a lecture on disease management of kinnow. Dr. Kulbir Singh Director Horticulture explained the importance of horticulture mission and its programs in detail.

13. ED programme on Modern Methods of Kinnow Processing

CIPHET scientists at Abohar organized a six-day duration entrepreneurship development program on kinnow processing. Dr. Satyavir Singh, Sr. Scientist (Chem. Engg.) was Course coordinator. Two upcoming entrepreneurs from Ganganagar in Rajsthan were given training on scientific production of kinnow and various unit operations involved in their processing and value addition.

14. DDG (Engg.) Dr. Nawab Ali paid a short visit to CIPHET on Jan 19, 2007



Profile of the Month

PROJECT PROFILE ON CATTLE FEED

INTRODUCTION

The livestock play an important role in the agrarian economy of most of the developing countries and more so in India because of small land holdings and a large percentage of rural population possessing no land. It also provides subsidiary occupation in semi urban areas and more so for people living in hilly, tribal and drought prone areas where crop output may not sustain the family. More than half of the rural population in the country is dependent on livestock, fully or partly, for their day-to-day sustenance. Livestock rearing serves multiple functions apart from generating productive employment in the rural areas. It accounts for 30% of the gross agricultural output and about 6 % of gross domestic product of the country. India is endowed with the largest livestock population in the world. It accounts for 57% of the world's buffalo population and 15% of the cattle population. According to the livestock census (2003) the country has about 18.5 crore cattle and 9.8 crore buffaloes (India, 2006, GOI)

India ranks first in the world with its milk production of 88.1 million tonnes (2003-04). Indian dairy industry has been showing a consistent growth rate of about 5% per annum. Dairy sector is also making valuable contribution to exports. The liberalized economy together with the opening of processing activity to private sector offers large scope for dairy industry in the coming years.

Dairying is an important source of subsidiary income to small / marginal farmers and agricultural labourers. The manure from animals provides a good source of organic matter for improving soil fertility and crop yields. The gobar gas from the dung is used as fuel for domestic purposes as also for the running engines to drawing water from well. The surplus fodder and agricultural by-products are gainfully utilized for feeding the animals. Bullocks supply almost all-draught power for farm operation and transportation. Since agriculture is mostly seasonal, there is a possibility of finding employment throughout the year for many persons through dairy farming.

According to 2001 census about 72.2% of India's total population lives in 5.87 million villages, cultivating over 145 million hectares of cropland. Average farm size is about 1.66 hectares. Among 70 million rural households, 42 % operate up to 2 hectares 37% are landless households. These landless and small farmers have in their possession 53% of the animals and produce 51% of the milk. Thus, small/ marginal farmers and landless agricultural labours play a very important role in milk production of the country. Dairy farming can also be taken up as a main occupation near big urban centres where the demand for milk is high. Central and State Governments are giving considerable financial assistance for creating infrastructure facilities for milk production.

Our livestock are generally poor producers because of poor feed and management and tropical heat and diseases. However, as a result of research work conducted by the scientists of the ICAR Institute, State Agricultural University, the Government and Non-Government Research Organizations etc. much is now known about the genetic resources, their production potential nutritional requirement, nutritional and environmental stresses improvement strategies have been developed and their application is now the basis of our livestock development programmes adoption of these strategies in the last 20 years has resulted in 2.5 fold increase in milk production, 3 fold increase in meat production and 20 fold increase in egg production. With this background, it is evident that quality cattle feed will always be in demands in the country, which is the leading milk producer of world.

2. PROCESS

Ingredients for compound cattle feed

Besides common salt and vitamin A, the following ingredients shall be used for compounded cattle feeds:

Grains and Seeds

- ❖ Barley (*Hordeum Vulgare*)
- ❖ Gram (*Cicer Qrietinum*)
- ❖ Guar Seeds (*Cyamopsis tetragonoloba*)
- ❖ Maize (*Zea mays*)
- ❖ Ragi (*Elcusine Coracana*)
- ❖ Bajra (*penniselium typhoides*)

Grain by products

- ❖ Arhar or tur, gram chuni, gram husk, guar meal, maize bran, maize gluten, feed and maize screenings, moong, rice bran, wheat bran

Oilcakes and meals

- ❖ Coconut oil cake and solvent extracted coconut oil cake meal
- ❖ Cottonseed oil cake and solvent extracted cottonseed oilcake (meal)

- ❖ Ground nut oil cake and solvent extracted groundnut oilcake (meal)
- ❖ Linseed oilcake and solvent extracted linseed oilcake (meal)
- ❖ Maize germ oilcake
- ❖ Mustard and rape oilcake and solvent extracted mustard and rapeseed
- ❖ Niger seed oil cake and solvent extracted Niger seed and rapeseed
- ❖ Safflower oil cake and solvent extracted safflower and rapeseed
- ❖ Sesame oilcake and solvent extracted sesame and rapeseed
- ❖ Soybean and solvent extracted Soybean and rapeseed
- ❖ Sunflower oilcake
- ❖ Cottonseed bran and cottonseed hulls

Tubers and Roots: Tapioca spent pulp, tapioca, and tapioca starch

Others: Molasses and urea

Ingredients for Mineral Mixtures

The following are the ingredients that may be used for compounding mineral mixtures for supplementing cattle feeds: -

1. Cobalt chloride
2. Cobalt sulphate
3. Common salt
4. Copper sulphate
5. Di-calcium phosphate
6. Ferrous sulphate or red oxide of iron
7. Limestone
8. Manganese sulphate
9. Oyster shell
10. Potassium iodide or potassium iodate
11. Zinc chloride
12. Zinc sulphate

3. BENEFIT-COST ANALYSIS

The financial analysis of the project on cattle feed having a rated capacity of 25 metric tonnes / month has been done on the basis of the following assumptions:

3.1. Assumptions

- | | | | |
|---|--|---|----------------------------|
| 1 | Land and building | : | to be obtained on rent |
| 2 | Average capacity of unit (75% of the rated capacity) | : | 19 metric ton/month |
| 3 | Recovery | : | 98% cattle feed |
| 4 | Monthly repair and maintenance charges | : | 1% of the cost of machines |
| 5 | Depreciation on machines and equipment | : | 10% per annum |
| 6 | Depreciation on furniture and tools | : | 20% per annum |
| 7 | Rate of interest | : | 11% per annum |
| 8 | Number of working days in a month | : | 25 |
| 9 | Total number of working days in a year | : | 300 |

10 Working hours/ day : 8

11 Capacity utilization : 1st year 50%, 2nd year 60%, 3rd year 70%, 4th year 80%, 5th and subsequent years 90%

As the cattle feed comprises of a mixture of five or more ingredients and the ratio and the ingredients also vary depending on the feed formulae, the cost of raw material for two feed formulae was worked out and its average was used in the calculation of working capital requirement. The calculations for formula (A) and formula (B) are given as under:

Formula (A)

Sr. No.	Ingredients	Percentage (%)	Quantity (MT)	Rate (Rs.)	Total (Rs)
1	Groundnut oilcake	15	2.85	8,000	22,800
2	Wheat bran	25	4.75	4,000	19,000
3	Rice bran	20	3.80	4,000	15,200
4	Maize	16	3.04	6,500	19,760
5	Zowar	15	2.85	6,000	17,100
6	Molasses	8	1.52	5,000	7,600
7	Mineral Mixtures	1	0.19	15,000	2,850
Total					Rs. 1,04,310

Formula (B)

Sr. No.	Ingredients	Percentage (%)	Quantity (MT)	Rate (Rs.)	Total (Rs)
1	Wheat bran	33	6.27	4000	25,080
2	Rice bran	33	6.27	4000	25,080
3	Gram husk	8	1.52	4500	6,840
4	Deoiled cake	24	4.56	8,000	36,480
5	Molasses	1	0.19	5,000	950
6	Mineral Mixtures	1	0.19	15,000	2,850
Total					97,280

Average cost of (19 metric tonnes) of ingredients = Rs. 1,00,795.00

3.2. Fixed Capital (Machinery and Equipment)

Grinder / pulveriser	:	Rs. 30,000/-
Mixer	:	Rs. 25,000/-
Electrical accessories	:	Rs. 5,000/-
Weighing scale platform type	:	Rs. 5,000/-
Other small tools or fixtures etc	:	Rs. 2,000/-
Stitching Machine	:	Rs. 5,000/-
Cost of machinery and equipment	:	Rs. 72,000/-
Electrical / installation (@ 20% of cost of machinery and equipment)	:	Rs. 14,400/-
Furniture and miscellaneous equipment	:	Rs. 5,000/-
Total		Rs. 91,400/-

3.3. Working Capital

Skilled worker (one)	:	Rs. 3,000/-
Unskilled worker (one)	:	Rs. 2,000/-
Raw material (feed ingredients)	:	Rs. 1, 00,795/-
Gunny bags, plastic woven sacks	:	Rs. 3,000/-
Electricity charges 25 kwh/ tonne @ Rs. 4 per kwh	:	Rs. 1,900/-
Other expenses consumables (lubricant, stationery etc)	:	Rs. 700/-
Telephone repair and maintenance (1 % of cost of machines)	:	Rs. 720/-
Transport charges	:	Rs. 1,000/-
Rent	:	Rs. 1,000/-
Total	:	Rs. 1,14,115

3.4. Total Capital Investment

Fixed capital	:	Rs. 91400
Working Capital for 60 days	:	Rs. 2,28,230
Total	:	Rs. 3,19,630

3.5. Annual Cost

Total working capital (Rs. 1,14,115 x 12)	:	Rs. 13,69,380
Depreciation on machinery and equipment	:	Rs. 7,200
Depreciation on furniture	:	Rs. 1,000
Interest on total capital investment	:	Rs. 35,160
Total	:	Rs. 14,12,740

3.6. Annual Sales

Total annual sale (18.62 tonne x 12) @ 7000/tonne : Rs. 15,64,080

3.7. Profitability (per annum)

Annual Profit = Annual sales – Annual Cost = Rs. 15,64,080– Rs. 14, 12, 740
= Rs. 1,51,340

Profit on sale $1,51,340 / 15,64,080 = 9.68 \%$

Return on capital investment $1,51,340 / 3,19,630 = 47.35 \%$

3.8. BREAK-EVEN POINT

Break-even point = [fixed cost / (fixed cost+profit)] X 100

Fixed cost

(i) Interest	:	Rs. 35,160
(ii) Depreciation	:	Rs. 8,200
(iii) 40% of annual wages	:	Rs. 24,000
(iv) 40% of utilities and overheads:	:	Rs. 20,736
(v) Rent	:	Rs. 12,000
Total	:	Rs. 1,00,096

$$\text{BEP} = [100096/(100096+151340)] \times 100 = 39.8 \%$$

$$\text{Pay-back period} = \text{total cost of the project} / \text{profit} = 91400 / 151340 = 0.61 \text{ years}$$

4. LIST OF MACHINERY MANUFACTURERS AND SUPPLIERS

1. DP Pulveriser Works, Modi & Modi Building No. 2, II nd Floor, 76 Nagindas Master Road, Fort Mumbai – 400 023.
2. Punjab Engineering Works, Phase IV, Mohali, Punjab.
3. Kaps Engineers, 831, GIDC Makarpura, Vadodra - 390 010, India.
4. Premium Engineers Pvt. Ltd. ,603, Chinubhai Center, Nehru Bridge Corner, Ashram Road, Ahmedabad – 380 009.
5. Argus Industries, K 19, Industrial Estate, Ambattur, Chennai – 600 058.
6. Meakins Agro Products Private Ltd., “MEKINS HOUSE” 6-3-1090/B/2 Rajbhavan Road, Somajiguda, Hyderabad – 500 482.
7. Batliboi and Company Pvt. Ltd., Apeejay House, V.B. Gandhi Marg, Mumbai-2
8. Guru Siddeshwara Engineering Works, Near Indi Pump, Hubli, Karnatka.
9. B.K.Allied Industries, G T Road, Khanna, Punjab.

Post harvest data of the month

Processing industries, number, employment and investment in Punjab (2003-04)

Sl. No.	Types	Numbers	Employment	Fixed Investment, Rs. Crores	Production, Rs. Crores
1	Ice Cream	196	1020	524.53	2000.96
2	Mfg. Of Pickles, Chutneys	124	638	463.93	1358.36
3	Flour Milling	4275	9220	6455.77	29883.59
4	Rice Milling	2305	38561	60188.83	273802.68
5	Dal Milling	27	256	237.75	1569.27
6	Mfg. of Cattle Feed	344	2600	2729.71	15458.58
7	Mfg. of Poultry Feed	88	354	211.63	1854.39
8	Mfg. of Bread Making	384	1869	1195.41	4080.82
9	Oil & Oil Cake	567	3943	5672.15	35914.37
10	Mfg. of Confectionery Goods	224	894	620.38	1700.35
11	Grinding & Processing of Spices	234	789	626.04	2532.66
12	Grinding / Pressing / Boiling	124	1592	1882.29	13573.3
13	Mfg. of Mixed Fertilizers	96	797	898.98	5500.98
14	Organic / Inorganic Chemicals	269	1649	2736.09	7262.5
15	Cold Storage	485	4307	14030.38	16785.03
16	Mfg. of Biscuits, Cake, Pastries	351	1413	855.82	1334.87
17	Mfg. of Aerated Drinks	171	737	543.13	697.77

Technology of the month

Mustard Sauce –A Delicious Product

A low cost process for production of pure vegetarian Mustard Sauce has been developed at CIPHET, Ludhiana.

Process consists of production full fat edible quality mustard flour using unique CIPHET process. The condiments, citric acid, vinegar, and plant based emulsifier, spices, salt are used in preparation of sauce in either sour taste and in sweet taste. The product meets International standard with preferred taste, colour, appearance and viscosity. CIPHET mustard sauce cost Rs 80/kg whereas conventional sauce cost Rs 250/kg. CIPHET mustard flour cost Rs 40/kg whereas imported mustard flour cost Rs 300/kg.

Technology has been licensed to Mrs Bectors Food Specialties, Phillour, Punjab at Rs. 2.65 lakhs along with the process for production of edible quality mustard flour for Rs. 3.80 lakhs



For further details contact:

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