



## A PRESENTATION ON

### GLOBAL CONFERENCE ON

"INTERNATIONAL NETWORK ON SAFETY & NUTRITION OF FRUITS & VEGETABLES"

BY

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ORGANISED BY

Amity International Centre for Postharvest Technology  
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Amity University Campus, Greater NOIDA, U.P.  
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## Mariental India Pvt. Ltd(MIPL)

Company Incorporated As An Indo-German Joint Venture In 1988

Based In New Delhi , With Joint Venture Partners In Germany At Hannover, Grafhorst & Nettetal

Mariental Offers Technical, Engineering, And Marketing Consultancy Services From Project Concept To Commissioning

Mariental Is Your Partner For Ever

## MIPL'S FIELDS OF ACTIVITY

☞ Food Processing And Agro Based Industries Covering Fields Such As

- 1.) Farming & Processing Of Fruit And Vegetables
- 2.) Potato Processing Complex
- 3.) Phyto Chemicals , Oleoresins & Natural Colours
- 4.) Fermentation Based Industries
- 5.) Complete Refrigeration Systems
- 6.) Modified Atmosphere Cold Storages & Complete Cold Chains
- 7.) Maize & Wheat Processing Complex
- 8.) Poultry And Livestock Farming & Processing
- 9.) Milk Processing
- 10.) General Processing Industries

## EXISTING GLOBAL AND INDIAN SCENARIO ON FRUITS & VEGETABLES



- > The major fruits produced in India are Mango, Banana, Citrus, Guava and Apple accounting for almost 75-80% of total fruit production.
- > More than 20-22% of the total production of fruits get lost due to their spoilage at various post harvest stages.
- > There is an overall increase in the demand of fruits and vegetables for consumption both in fresh and the processed form.
- > Total consumption of fruits and vegetables in the country has increased over the past five years from Rs.137,000 crores in 2000-2001 to Rs.1,81,000 crores in .....
- > According to NSSO 2005, the per capita expenditure on fresh vegetables is Rs.461 and on fruits Rs.117 with the average annual growth rate of 9.4% and 8.7% respectively.

## STATUS OF INDIA IN PERISHABLE COMMODITIES



### India Produces

- > 50% of World's mango
- > 23 % of Banana
- > 36 % of Cashew nut
- > 28 % of Cauliflower
- > 28 % of Green Peas
- > 10 % of Fruits & Vegetables
- > 16 % of Milk
- > 11% of Onion

## FOOD PROCESSING STILL AT A NASCENT STAGE



### Level of processing (Fruits & Vegetables)

- > USA 80%
- > France 70%
- > Malaysia 80%
- > Thailand 30%
- > India 1.3%

## THE GREAT PARADOX PRESENTLY FACING FPI IN INDIA

- > The post-harvest losses of fruits and vegetables are estimated to be 25 to 40 %, amounting to more than Rs. 50,000 crores. (US \$ 11 bill.)
- > *Yet less than 2 % is processed!*
- > By 2010, Indian population expected to be 1.25 bill., including 750 mill. Below 30 years; the Most Potential Market Segment
- > We have a middle class of 250-300 million people with adequate purchasing power to buy manufactured goods...
  - > *Yet value addition to agricultural products is below 7 %*
- > We are among the top few producers of many agricultural commodities in the world...
  - > *Yet our share in the world food trade is only 1.6 %*

## PERENNIAL PROBLEMS OF GLUT



Contd....

### Level of processing in India (Perishable Products)

	Organized	Unorganized	Total
> Fruits / Vegetables	1.3%	0.8%	2.2%
> Milk/Milk Products	13%	22%	35%
> Buffalo Meat	21%	-	21%
> Poultry	6%	-	6%
> Marine Products	8%	15%	23%

## ESTIMATED DEMAND OF POTATO PRODUCTS IN INDIA

1. The demand for ready to eat food products shall be the inevitable and volumes are going to be enormous. The most accepted, convenient and affordable RTE food for this vast segment of population are going to be Processed Potato Products.
2. The existing inert demand estimated for Processed Potato Products in India is :
 

Products	Demand M.T.	Unit Rate	Approx. Annual Return (Rs.Crores)
i. French Fries	3,98,000	45.00	1791.00
ii. Potato Flakes/Granules	3,60,000	52.00	1872.00
iii. Potato Chips	85,000	100.00	850.00
iv. Mashed Potato Products	1,82,000	80.00	1456.00
v. "Bhujia" * i.e.	43,000	95.00	908.00
* RTE, Spiced Vermicilli type Indian Potato Snack			<b>TOTAL 6877.00</b>
3. Total Potato requirement to produce these products would be about 23 lakh tonnes which would necessitate the setting-up of about 40 units in the country at an estimated cost of Rs.1600 crores approx (US \$ 330 mill. approx.)

## STAGES OF FOOD PROCESSING WHERE TECHNICAL UPGRADATION AND MODERNISATION IS URGENTLY REQUIRED

1. **PRE- HARVEST MANAGEMENT WITH CONTRACT FARMING**
  - i. To Provide technical and material inputs to farmers.
  - ii. To Provide training to farmers on:
    - a. preparation of soil
    - b. sowing of seeds
    - c. nurturing the plants
    - d. disease prevention -selection of pesticides etc. & quantification of spray
    - e. assessing the maturity of crops for harvesting
2. **POST-HARVEST MANAGEMENT**
  - i. To Introduce modern techniques for harvesting, handling and transportation of primary crops with extended shelf life of farm fresh products
  - ii. To Set up facilities for Cleaning, grading and packing of fresh produce at farm level, so as to
    - a. segregate raw material for processing and direct sale to consumer
    - b. store the surplus farm produce
    - c. to provide effective transportation of fresh produce to processing units

CONTD.....

## Enormous Volumes for handling, storage & processing for Preservation

S. NO.	CROP	MAJOR PRODUCING STATE	ESTIMATED PRODUCTION TPA	PERIOD OF HARVESTING DAYS/ANNUUM	DAILY HANDLING MT
<b>Fruits</b>					
1.	Apple	J&K	10,00,000	40	25,000
2.	Banana	Tamil Nadu	48,40,000	60	81,000
3.	Litchi	Bihar	3,18,000	20	15,900
4.	Mango	A.P.	24,00,000	50	48,000
<b>Vegetables</b>					
1.	Peas	U.P.	10,50,000	25	78,000
2.	Brinjal	U.P.	12,00,000	60	200,000
3.	Cauliflower	U.P.	16,40,000	60	41,000
4.	Tomato	Bihar	12,50,000	50	25,000

Objective: 1. Year round availability at Uniform Price in Retail  
2. To overcome irrational peak & lean period cost ratio exceed 20:1 at times.

### STAGES OF FOOD PROCESSING contd....



3. **PROCESSING**
  - i. Selection of product mix vis - a - vis Global Demand.
  - ii. Supply of technology and equipment for processing
  - iii. Offering modern quality control techniques vis-a-vis codex standards
  - iv. Market promotion and distribution
4. **R&D**
  - i. Improving raw material and handling techniques
  - ii. Development of new & innovative food products.
  - iii. Design and development of unit processes and unit operations
5. **SOURCING OF PLANT AND MACHINERY**
6. **TRAINING OF MANPOWER**

### PROSPECTIVE PROJECTS ON PROCESSED FRUIT & VEGETABLE PRODUCTS



Product	Capacity	Estimated Capital Cost Of Project, Rs. Lacs	Estimated period of Implementation ,months
1. Individually Quick Frozen Product	2000 kgs/hr	3000.00	15
2. Dehydrated Products			
i. Vacuum Freeze Dried	375 kgs/day	1800.00	12
ii. Microwave Vacuum Dried	1200 kgs/hr	1400.00	10
iii. Mechanically Air Dried	1100 kgs/hr	1200.00	10
3. Pulps, Purees & Concentrates (Multiple Fruits) in bulk Packs	12 TPH (Input)	3500.00	18
4. Potato Processing Complex (Frozen French Fries, Potato Crisps, Flakes/Granules, Mashed Potato Products)	10 TPH (Input)	7500.00	20

### PRIMARY STEPS IN PROCESSING FRUITS & VEGETABLES



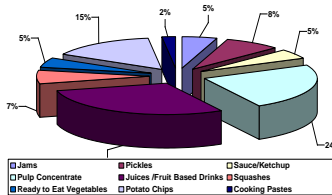
Primary steps in processing fruits and vegetables include-

- Sourcing & Collection
- General cleaning and dirt removal,
- Removal of leaves, skin, and seeds,
- Treatment & Sizing
- Washing and cooling,
- Grading & Packaging, and
- Cleanup.

### FRUITS & VEGETABLES PRODUCTS IN ORGANISED SECTOR



Figure - 1.15  
Fruit & Vegetable Products in Organised Sector



### MAIN REASONS FOR TOO HIGH WASTAGES OF FRUITS & VEGETABLES



- Poor Post Harvest Handling Infrastructure
- Inadequate Storage Space
- Absence of Processing Facilities for preservation & value addition.
- Un-remunerative returns to farmers
- Negligible utilization of physically impaired grades of the fresh produce, which otherwise could be processed into value added products.

### REDRESSAL STRATEGY ON FRUITS & VEGETABLES



- Application of pre and post-harvest technologies to develop and stimulate the horticulture production of quality F & V, prevent post-harvest losses.
- Improve the characteristic properties and add value to the products through processing.
- To plan and set-up modern and effective storage system based on modified & controlled atmosphere at low temperature for F & V mainly through PPP or BOOT Schemes.
- Facilitating and encouraging entrepreneurship for ventures into F & V processing industry in large or medium scale would help the effective utilization of the valuable horticulture produce, with assurance to the farmers of quick disposal of produce at remunerative price and for the consumers to enjoy the F & V of choice throughout the year at uniform and affordable price.
- To encourage application of technology for effective utilization of byproducts with value addition.

## KNOWLEDGE BUILDING STRATEGY ON FRUITS & VEGETABLES

- > Creation of awareness amongst the farmers and the rural youth about the new development in agriculture practices, engineering and technology at field level.
- > Introduction of regular training programmes for the new entrepreneurs, farmers and even the agricultural laborers.
- > Introduction of different types of modern agricultural implements, tools and machinery at farm level wherever necessary.
- > Setting up of Agro Processing Centers in each village for primary processing of F & V.
- > **Overcoming the Technology Gaps**
- > For reducing the uncertainty over the availability of the raw materials, the following procedures/ solutions are recommended:
  - > To encourage Contract Farming, which is anyway inevitable, for the processing units to ensure the un-interrupted supply of quality raw materials at economically optimum cost.
  - > Providing technical & material inputs to farmers.
  - > Earning confidence & trust of farmers by securing their economic interest.
  - > Promoting close interaction between R & D institutions and Agriculture Universities of repute.
- > Introduction of technology up-gradation with innovations as a continuous endeavor.

## TYPICAL CASE STUDY ( Ref. : A Potato Processing Complex )

1. India with production of 25 mill.TPA is the 3rd largest potato producer in the world after China and Russia.
2. The Potato processing is negligible while some processed potato products such us Frozen French Fries are totally imported by the MNC's for their chain of restaurants.
3. USA produces 3.8 mill. TPA, Canada 4.0 mill.TPA and Netherlands also 4.0 mill.TPA ( approx. ) of Potato French Fries.
4. Other Processed potato products include Potato Crisps, Potato Flakes, Potato Granules, Washed Potato Products, Potato Omelet's & Cakes and Potato Starch & Vodka.
5. Cultivation of Potato - a classic example in India that drives the farmers to desperation, whether he produces in abundance or does not produce at all.
6. During harvesting period farmer's return are too little to afford the wages for labour.

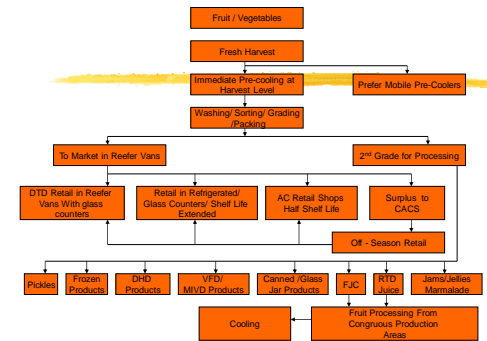
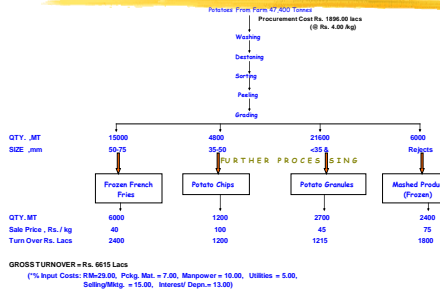
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## ENSURING HOMOGENEITY OF FINISHED FRUIT AND VEGETABLE PRODUCTS

- The various steps involved to ensure the uniform quality of the finished product produced from heterogeneous raw material involves the:
- > Selection of modern techniques in processing.
  - > Selecting the process plant & machinery with proven performance in modern processing units in operation.
  - > Technology exchange programmes with the foreign companies / manufacturing units of repute.
  - > Imparting high-class training to local production personnel

## A Potato Processing Complex





**Thank You**