SNS COLLEGE OF TECHNOLOGY
AN AUTONOMOUS INSTITUTION

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DEPARTMENT OF AGRICULTURE ENGINEERING

COURSE CODE & NAME: 19AGT401 & Post Harvest Engineering

IV YEAR / VII SEMESTER

UNIT : I - THRESHING, MOISTURE MEASUREMENT AND PHYSICAL PROPERTIES OF AGRICULTURAL PRODUCES

TOPIC 2 : Post harvest losses of cereals, pulses and oilseeds, Optimum stage of harvest

Food Production

Item	Qty	Item	Qty
Cereals	195	Milk	91
Oilseeds	15	Meat	5
Pulses	20	Fish	6
Sugars	270	Egg	3
Vegetables	100		
Fruits	45		
Plantation Crops	5		
Total	650		105

Postharvest Operations

- Cleaning, Grading and Sorting
- Drying and Dehydration
- Storage
- Milling
- Handling, Packaging and Transportation
- Waste utilization

PRODUCTION OF DIFFERENT FOOD COMMODITIES AND THEIR ESTIMATED POST-HARVEST LOSSES IN INDIA

Type of food commodity	Present Level of production			Post-harvest losses		
	Quantity Mt	Average price Rs/t	Value, Rs, Cr.	%	Quantity, Mt	Monetary value, Rs, Cr.
1. Durables (Cereals, pulses and oilseeds)	215	1000	215000	10	21.5	21500
2. Semi-perishables (Potato, onion, sweet potato, tapioca)	40	3000	12000	20	8.0	2400
3. Perishables (Fruits, vegetables, milk, meat, fish and eggs)	140	15000	210000	25	35.0	52500
Total/Average	395	11063	437000	17.5	64.5	76400

Mt = Million tonnes and Cr = Crore (10 million)
One US dollar = Rs. 50 (Rs=Indian Rupee)

PH Losses in various stages

Harvesting : 1-3%

Threshing : 2-6%

Drying : 1-5%

Handling : 2-7%

Milling : 2-10%

Storage : 2-6%

Ways to Minimize PH Losses

- Harvesting at the right moisture
- Adjustments of the combine
- Drying immediately
- Handling practices
- Sanitation of the storage
- Monitoring storage

Food Processing

Purpose is to minimize *quality and quantity loss* of food materials after harvest

Classification of Technologies

Addition of Heat

✓Pasteurization & sterilization

✓Others cooking, baking, roasting, frying

Removal of Heat

✓Refrigeration & freezing

High pressure, Pulse Electric Field

✓Non Thermal Technologies

Radiation

✓Generation of heat (IR, MW, RF, ohmic)

✓Without heat generation (UV, Irradiation)

Control of Environment

✓CA/MA Storage/Packaging

Classification of Technologies

- ✓**Removal of water**
  - ✓Liquids (Evaporation, membranes, drying)
  - ✓Solids
    - ✓Heat (Drying, freeze drying)
    - ✓Mechanical (Pressing, filtration)
- ✓**Concentration (evaporation, extraction)**
- ✓**Separation of constituents (Extraction SCFE, osmosis, reverse osmosis)**
- ✓**Composition control (dissolved oxygen, fermentation, salting, smoking)**
- ✓**Preparation of raw materials (washing, cutting, grinding, mixing, juice extraction)**
- ✓**Multiple operations – extrusion, IMF**

LOSSES AT DIFFERENT STAGES OF POST HARVEST SYSTEM

STAGE	TYPE OF LOSS
After Harvesting	Pest or rodent attacks
Drying	Insufficient drying leads to microbial attacks (mould growth)
Threshing	Inappropriate threshing leads to shattered grains and broken pulse grain attracts more insect infestation.
Storage	Improper storage conditions are thriving place of insects, rodents, pests and microbes
Milling	Increased broken grains and powdered pulses
Transportation	Loss in weight of product
Packaging	Defective packing leads to loss in quantity and quality of crop

HOW TO CURB POST-HARVEST LOSS

Few preventive measures can be adopted by pulse farmers to curb these losses:

1. Harvesting should be done when crop reaches maturity
2. Harvesting method employed should be appropriate.
3. Improved technology and equipment should be used.
4. Modern processing techniques should be used.
5. To save money, cleaning and grading should be done at low price.
6. Excellent packaging technology should be used.
7. Proper storage conditions.
8. Proper and efficient transportation and handling system.

THANK YOU...