Modern and climate smart food supply chains
Preharvest

Innovations in cold chain supply

Processing equipment
PROBLEMS

- Climate change
- Losses in orchards
- Losses in storage
- Limited knowledge
- Lack of financing
LONG-TERM STORAGE FACTORS

Climate and place

Agricultural technology

Harvest time

Technology of storage
Environment protection and Cleaner production

Innovations in cold chain supply:

- Environmentally Friendly Refrigerants
- Energy Saving Systems
- Automation systems
- Innovative technologies of storage
- Storage management
Environmentally Friendly Refrigerants

- Ozone-friendly refrigerants with zero ozone depletion potential
- Natural refrigerants:
  - Hydrocarbons (propane, isobutene)
  - Ammonia
  - CO2
  - Water
  - Air

Key Benefit: Reduced environmental contamination and preservation of ozone layer, reduced global warming potential
Energy Saving Systems

- Alternative energy sources
- High Tech equipment
- Insulation and temperature preservation systems

**Key Benefit:** Reduced energy costs, increased storage period, keeping top quality products
Automation systems

- Sensors system
- Automatic control
- Software

Key Benefit: Strict products quality control, saving labor cost, getting high quality fresh products
Innovative technologies of storage

**Temperature**

**Ventilation**

**Humidity**
>92-98%

**Controlled atmosphere**
- CO₂
- O₂
- Ethylene

ULO-, DCA-, 1-MCP

**Key Benefit**: Long term storage with minimum products losses, prolonged shelf life of fresh products after storage
LLP Fresh Fruits, Kazakhstan

Projects

Intensive orchard

High technology storage

MCP-1

Apple juice processing line

For 9 months of storage product losses are down to 1%!

Due to gas-tight rooms, for 3 months of storage, equipment needed to be operated for 72 hours only!
Innovative technologies of storage

- Pre-cooling
- Fast-cooling
- Hydro-cooling
- Palliflex system

Key Benefit: Reduced energy consumption, keeping products quality
Storage management

Functional arrangement of space:

- Cold Storage
- Loading / Unloading
- Sorting / Packing

Key Benefit: Reduced energy costs, increased efficiency and speed of loading and unloading, to meet international standards of marketing and commercial quality control of fresh products
Temperature control on every step

Key Benefit: To keep high quality fresh products and minimize losses
Natural juices and puree

Drying

Key Benefit: Minimized general losses in fields and storage, realize more profit
Support the promotion and implementation of high technologies

Education

- Increasing knowledge
- Invite professionals for training and seminars
- Visit professional world exhibitions
- Create demonstration projects

Financial Support

- Government grants and state subsidies
- Low rate loan
- Single agricultural tax
- Set up industrial cooperatives and clusters
- Involve international financing consulting organizations
- Partnership for partial financing
Caring for the environment, innovation and high technologies help us to save our Planet!
Thank you!

Any questions?
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