

# Modern and climate smart food supply chains

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16.05.2023, Bangkok







#### Innovations in cold chain supply









- Climate change
- Losses in orchards
- Losses in storage









Limited knowledge











#### 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



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P @ R & R 1 7 2 Acre 1	• Zweps 01-Knops 12 • P		
Kanepa BI   1.3 °C (1.0 °C)   111 1.4 °C (%)   1702 0.0 (%)   0.2 1.7 % (1.7 %)   0.02 2.4 % (2.5 %)   0.000 2.4 % (2.5 %)   0.0000 2.4 % (2.5 %)   0.00000000 12 news 1   0.00000000000000000000000000000000000	Kampo 02   TK 6.3 % (200 %)   1711 6.5 % (200 %)   172 0.9 (200 %)   02 203 % (200 %)   D02 0.9 % (0.0 %)   D03 % 0.0 % (0.0 %)   D00matches 0.0 % (0.0 %)   Bernoratus 0.0 % 0	Kareps 00   TK 7.1 °C [-1.0 °C]   TM 7.5 °C [-1.0 °C]   TT2 0.0 [-1.0 °C]   0.2 0.5 °C [-0.0 °C]   DO 0.8 °C [-0.0 °C]   Bersussaue 0 °C 0	Konepa 04   TK 1,5, ℃ (1,3, ℂ)   TM 1,6, ℃ (3,0,0)   0,0 1,3, % (1,3, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (0,5, %)   0,02 1,4, % (0,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (0,0,0)   0,02 1,4, % (1,5, %)   0,02 1,4, % (1,5, %)   0,02 1,4, % (0,0,0)   0,03 0,0 0
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Kanepa 09   TK 2.7 °C (2.0 °C)   TP0 0.8 (2.0 °C)   TP2 0.8 (2.0 °C)   O2 0.8 °C (2.0 °C)   O3 0.8 °C (2.0 °C)   Occasione 12 men. 5 Tamu   Accoder 0 0   Bencimaet 0 0 0	Kaseepa 10   TK 32 °C 128 °C   Th1 0.0 170 °C 128 °C   TD2 168 °X 20.0 °X 1   O2 168 °X 20.0 °X 1   O3 2.5 °X (0.0 °X) 3 3   Ossessene 28 rese. 225 °X to 0.0 °X 3 3   Ossessene 30 rese. 25 °X to 0.0 °X 3 3 3	Kannege 11   1% 6.2 °C 1.0 °C)   1711 0.8 0.0 °C)   02 20.5 % (.20.5 %)   04 0.0 % (.00.5 %)   05 0.6 % 0.0 Tartue   Accode 0 0 Demanante 0   0 0 0 0	Bernarto Demoirse   Datación Demoirseaie 02   Bernartop Actor   D'inselence Monaneera   Accopt. CO2 Halsaderee CO2

Key Benefit: Strict products quality control, saving labor cost, getting high quality fresh products



#### Innovative technologies of storage







Key Benefit: Long term storage with minimum products losses, prolonged shelf life of fresh products after storage

#### **Projects**

#### LLP Fresh Fruits, Kazakhstan





#### 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











Key Benefit: Minimized general losses in fields and storage, realize more profit





Support the promotion and implementation of high technologies





#### **Financial Support**

▲ Increasing knowledge

▲ Invite professionals for training and seminars

Visit professional world exhibitions

Create demonstration projects

台 Low rate loan

A Single agricultural tax

▲ Set up industrial cooperatives and clusters

Involve international financing consulting organizations

A Partnership for partial financing

# Caring for the environment, innovation and high technologies help us to save our Planet!



# **Thank you!**



Any questions? You can find me at irinasalatina@gmail.com

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