

COLD CHAIN INNOVATIONS

Protecting your valuable cargo

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What are perishable cargos ?

MEAT



FISH / SEAFOOD



FRUIT



VEGETABLES



Why do perishable need protecting?

1. reduce food loss
2. avoid food waste
3. food safety
4. quality



Best practices for long distance refrigerated transport of perishables

1

COLD CHAIN
BASIC
PRINCIPLES

2

POST
HARVEST

3

PACKAGING
& OTHER
FACTORS

4

COLD CHAIN
INTERGITY

1

COLD CHAIN BASICS

- **Refrigerate** right after slaughter, fishing, processing
- Control **humidity**
- **Ventilation**
- Control **air composition**
 - Fruit & Vegetables living organisms
 - Maintain conditions like where grown, or “slow ripening” with composition of the air



2

POST HARVEST

- **Cool down in “field”**

Example: Raspberries, strawberries pull down to 0°C as fast as possible

- **Hot Water treatment**

Example: Mango, in hot water, illuminate with far red, cool down in steps to set-point. Lower O₂ to 1%
Prevent chilling injuries



3

PACKAGING & OTHER FACTORS

- Packaging to ensure airflow
Pre-Cool cargo
- Cold Chain Integrity
- Avoid long cold chain breaks
- Use genset on road and rail
 - Diesel
 - Battery power



4

COLD CHAIN INTEGRITY

Transport preparation – Chilled & Fresh cargo

- Reefer health:
 - PTI status. Patented SMART PTI
- Configure trip:
 - Temperature and mode
 - Humidity and ventilation
 - Select commodity in TK Fresh app

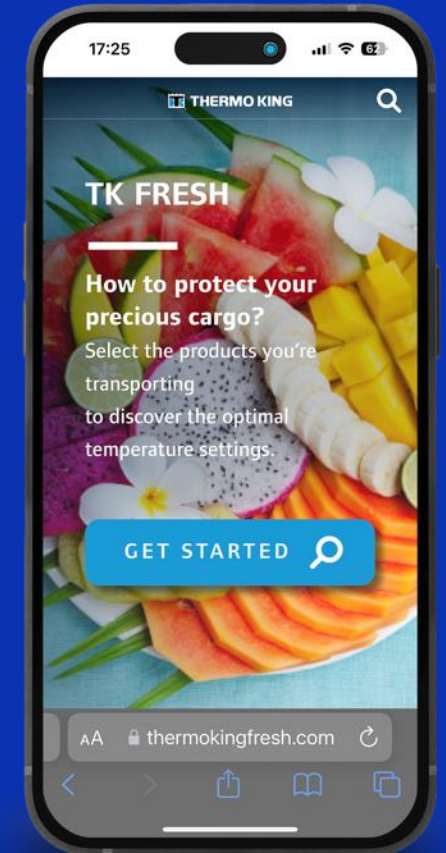


4

COLD CHAIN INTEGRITY

Transport preparation – Active Controlled Atmosphere

- Set ideal parameters for O₂ and CO₂
- Install ethylene scrubber and curtain
- Load Cargo
- Install sensors and trackers
- Start journey w/Energy Logging
- Telematics enabled



4

COLD CHAIN INTEGRITY

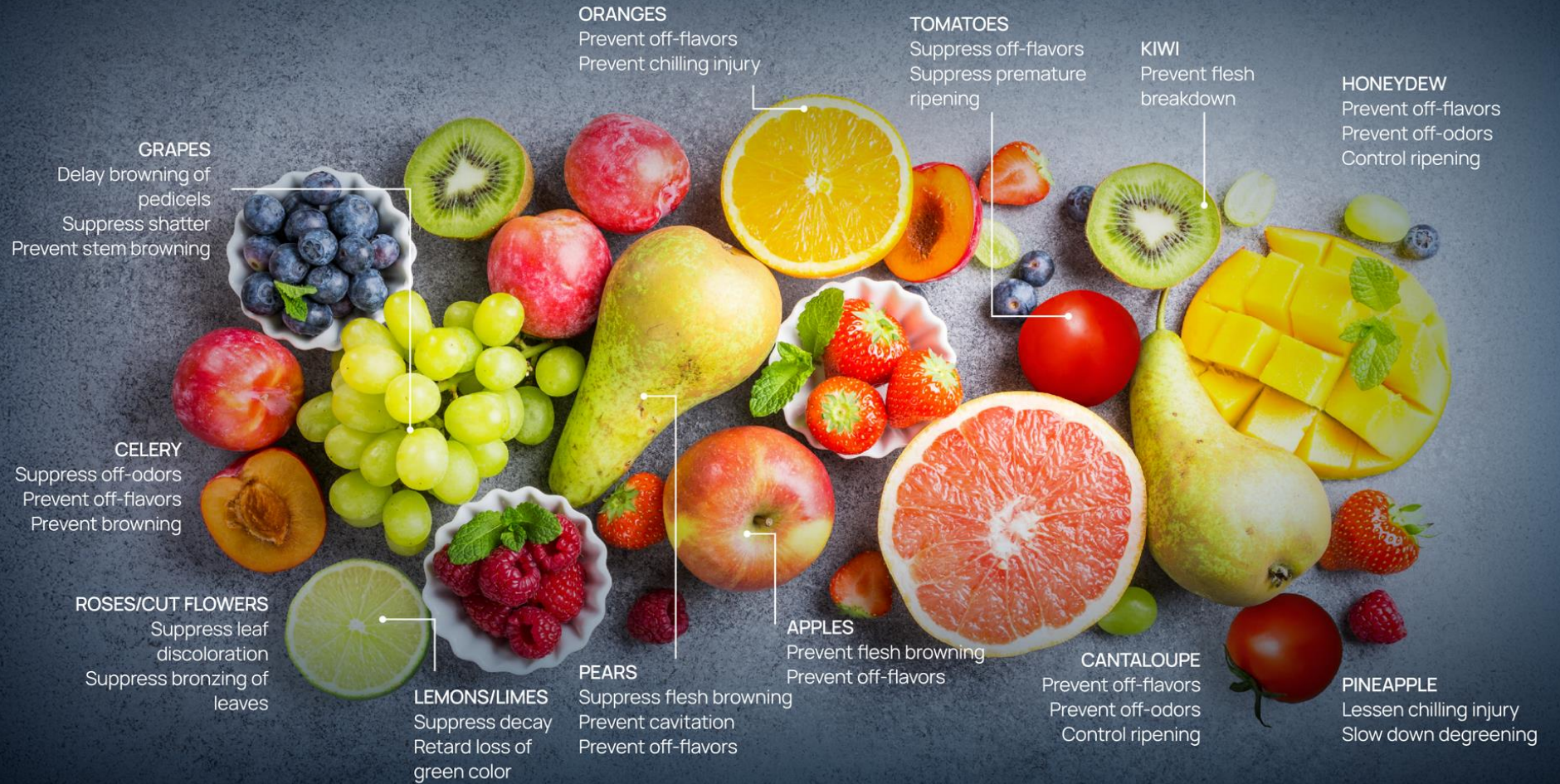
Active CA - TK Active Fresh

- N₂ enabled technology
- Smart control of O₂ and CO₂
- Fast O₂ pulldown
 - Airflow to box 28 l/min
 - Reach O₂ setpoint before CO₂
 - 48 hours to reach 5% O₂
- High ventilation rate: 90 l/min
- Option to pre-charge N₂



4

COLD CHAIN INTEGRITY



Total cargo

285M tons

Total F&V

146M tons

22% of F&V

CA benefit

32M tons

Our Cold-chain industry has the obligation to protect food

From harvest to consumption

Proven technologies available

Food loss and waste can be minimized

Value can be optimized



Thank you!

Visit us at stand B20

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