How cold storage work and managing perishable cargo

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Perishables and cold storage logistics

Perishables

- Perishables are products (mainly food) which are likely to spoil, decay or become unsafe to consume if they aren't kept within specific environmental parameters (mainly include but not limited to fresh fruits, vegetables, milk, meat, poultry, seafood, eggs, processed food, semi processed food and other non food perishable materials).
- Fresh produce usually have high water content, which enables bacteria to multiply fast and perish. Non food perishables start the process of perishing mainly due to high levels of humidity.

Cold Storage Logistics

- A logistics chain which brings perishable and temperature sensitive products from manufacturers to the consumers is known as cold storage logistics.
- It uses similar channels as ordinary logistics to route these products from manufacturers to consumers, but the complete logistical chain is temperature controlled and there might be involvement of more intermediaries in the process such as TC 3PL storage and transport providers.
- If the temperature maintenance fails at any point within the chain, products will be unfit for use.


Areas of importance for perishables handling

Environment

Temperature

Must be stored, transported and handled in a temperature controlled environment.

Humidity

Must be stored, transported and handled in environments with acceptable humidity levels.

Contaminants

Must be stored, transported and handled in ways that the product quality is not affected by contaminants.

Packaging

Sealed packaging

Packaging should be done to avoid or minimizes possible contaminations

Product protection

Packaging should provide adequate protection to products against external damages and temperature deviations

Physical Handling

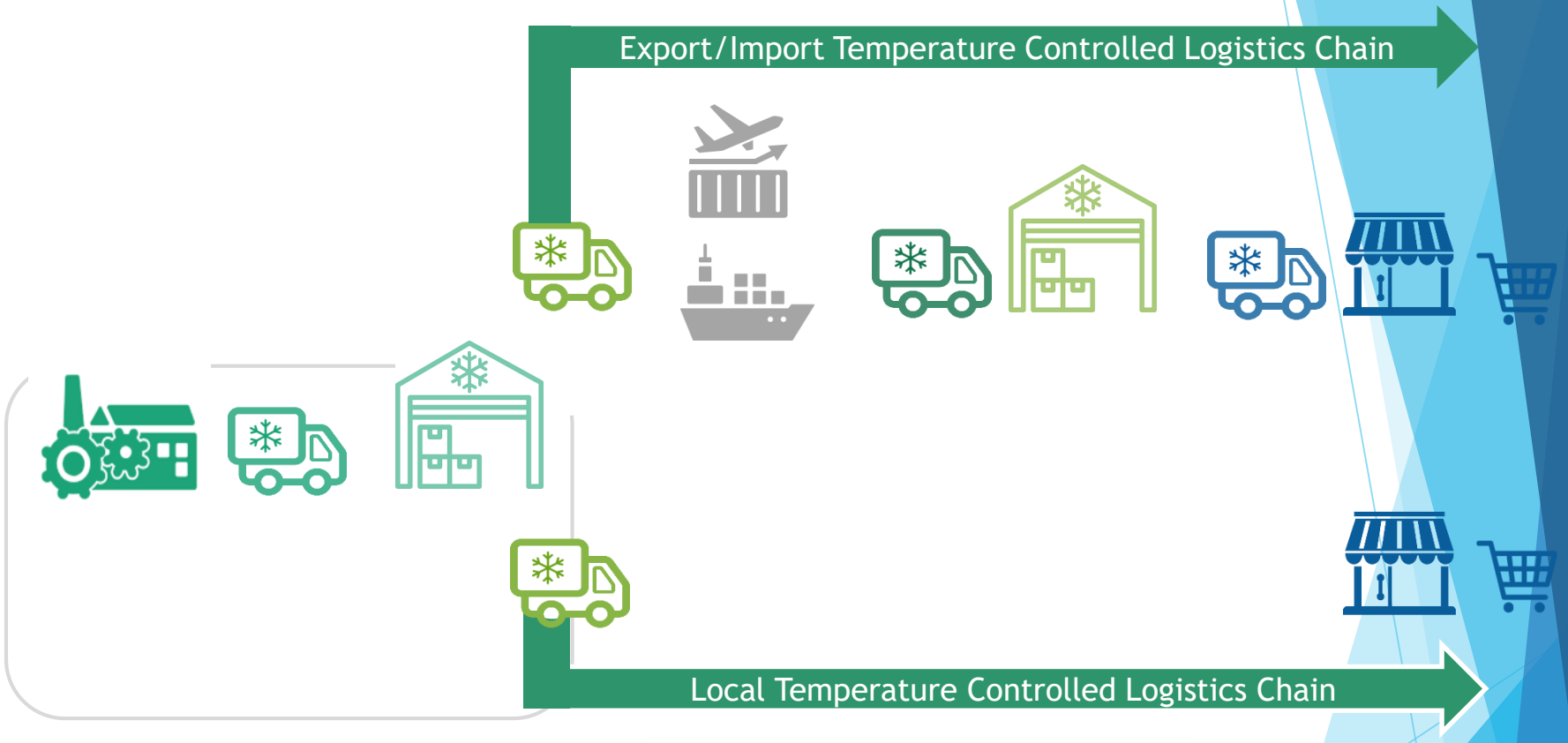
Careful handling

Handling needs to be done with utmost care to avoid product damages

Right equipment

Right equipment need to be used to handle to avoid any possible damages. (battery operated equipment).

A typical cold chain of perishables



Cold Chain: Step 1: Manufacturer

Step 1: Manufacturer

- **Obtain information regarding the ideal temperature for products.**
- **Obtain information regarding any special handling requirements for products.**
- **Plan the voyage and packaging based on information obtained.**
- **Adequate packaging.**
- **Entering products to a cold chain with the required temperature instantly.**

Cold Chain: Step 2: Primary Transfer

Step 1: Transporting

- Precooling the truck to required temperature.
- Load products with care.
- Stack acceptably.
- Allow the temperature to increase to required level after loading.
- Transport the products with care.
- Maintain the right temperature during the journey.
- Unload the products with care.

Cold Chain: Step 3: Cold Storage (Warehousing)

Step 1: Cold Storage

- Check receiving temperatures.
- Check for damages and spillages.
- Unload and handle products with care.
- Take inventory into the WMS.
- Maintain the right temperature during the storage period.
- Maintain acceptable humidity levels.
- Store product with compatible products.
- Manage contaminants and allergen effects.
- Issuing of perishable products on FMFO method.

Cold Chain: Step 4: Cold Storage (Secondary Transport)

Step 1: Transporting

- Precooling the truck or reefer container to required temperature.
- Load products with care.
- Stack acceptably.
- Allow the temperature to increase to required level after loading before commencing the journey.
- Transport the products with care.
- Maintain the right temperature during the journey.

If it's a local distribution

- Minimize the number of times doors are opened and closed.
- Unload the products at retailer points with care.

Cold Chain: Step 5: Cross country transport

Export / Import Logistics

Step 1: Sea or Air Cargo

If sea cargo

- **Make sure the reefer temperature is set and plugged in correctly during the voyage.**
- **Make sure the reefer containers are loaded and unloaded carefully.**

If air cargo

- **Make sure special packaging required for air cargo is done.**
- **Make sure the required temperature is maintained.**
- **Unloading and loading products carefully.**

Cold Chain: Step 6: Cross border transport

Step 1: Transporting

- Precooling the truck or reefer to required temperature.
- Load products with care.
- Stack acceptably if air cargo.
- Allow the temperature to increase to required level after loading if air cargo.
- Transport the products with care.
- Maintain the right temperature during the journey.
- Unload the products with care.

Cold Chain: Step 7: Distribution Cold Storage

Step 1: Cold Storage

- Check receiving temperatures.
- Check for damages and spillages.
- Unload and handle products with care.
- Take inventory into the WMS.
- Maintain the right temperature during the storage period.
- Maintain acceptable humidity levels.
- Storage of product with compatible products.
- Manage contaminants and allergen effects.
- Issuing of perishable products on FMFO method.

Cold Chain: Step 8: Distribution

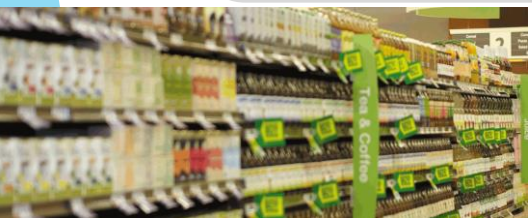
Distribution to Retailers

- **Minimize the number of times doors are opened and closed.**
- **Transport goods at the required temperature.**
- **Unload the products at retailer points with care.**

Cold Chain: Step 9: Retailer Point

Step 1: Retailer

- Receive products with care.
- Store products at required temperature levels.
- Store products in environments that do not contaminate with allergens or otherwise.



Temperature Control and it's importance

- Temperature required for different products vary based on the product. This information needs to be taken from a reliable resource (based on research outcomes).
- In ideal temperatures, the bacteria and pathogen activity is hindered and therefore, allows the product to be kept longer.
- Temperature deviations could activate the bacteria and pathogens which helps in starting the perishing process.
- Once the process is commenced, its will continue even if it is re entered into the right temperature.
- Potential impact of a temperature deviation is large because unlike a physical damage for a few products, this affects the complete volume of affected products.

Important Takeaways

- Planning need to be done before producing/harvesting (window of good quality and where it needs to be taken)
- Making sure the products are cleaned before packing – cleaning is critically important.
- Make sure the products are packed adequately and inserted into a cold chain with the exact required temperature as soon as possible.
- Transporting – make sure the product core temperature is exactly there, make sure the carrier is pre cooled to the adequate temperature. Make sure the carrier has the required temperature before carrier leaves.
- Cold storage – Need to have the required temperature, must not store with possible contaminants, Need to be handled carefully.
- Inventory management need to be done on a first manufactured first out basis.
- It is important to be vigilant about the diseases and if there is any abnormality, steps need to be taken to immediately destroy them and not to let it contaminate other products.

Thank you!

For any questions or inquiries

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