



IN PARTNERSHIP WITH



CROSS-BORDER LOGISTICS TRADE AND BOOSTING LOGISTICS TECHNOLOGIES IN MEKONG COUNTRIES

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CROSS-BORDER LOGISTICS TRADE AND BOOSTING LOGISTICS TECHNOLOGIES IN MEKONG COUNTRIES



Cross-border Logistics Trade

Opportunities in the
GMS by the Laos-
China Railways



Boosting Logistics Technology

Liquid Nitrogen Freezing



Way forwards

Strengthening of intra-
regional infrastructure
linkages

Cross-border Logistics Trade

Opportunities
in the GMS by
the Laos-
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Railways



Photos are from <https://www.tap-magazine.net/blog-th/foc67>

Frozen Technology

- With the further improvement and development of frozen technology, it was quickly and widely used in fish, shrimp, crab, chicken, duck, meat (cattle, sheep), fruit (myrica rubra, lychee, etc.), vegetables and all kinds of prepared food.
- Frozen technology has broken the boundaries of time and space, let the food around the world can become different global delicacy



APPLICATION CASES IN MEAT AND POULTRY



APPLICATION CASES IN MEAT AND POULTRY



Liquid Nitrogen Freezing

Nitrogen (LN2):

- Is the nitrogen in a liquid state at low temperature, -196°C boiling point at sea level.
- is widely used as a cooling agent



Carbon dioxide (CO2):

- is the carbon dioxide in a liquid state at low temperature, -78.46°C boiling point at sea level.
- is widely used as a cooling agent

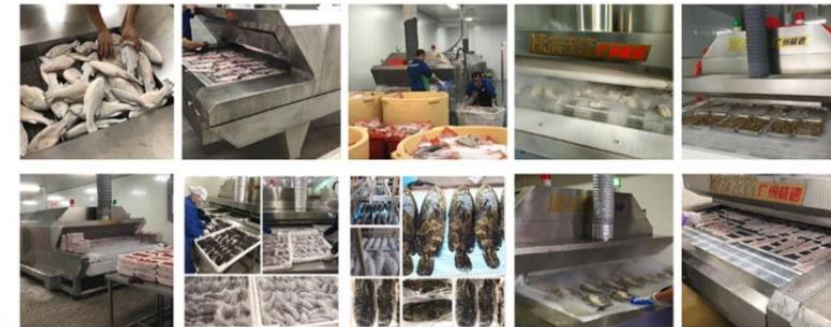


Ammonia (NH3):

- Is the ammonia in a liquid state at low temperature, -33.6°C boiling point at sea level.
- is widely used as a cooling agent



APPLICATION CASES IN SEAFOOD PRODUCTS



Boosting Logistics Technology

LIQUID NITROGEN FREEZING VS CONVENTIONAL FREEZING

When we freeze foodstuffs, the water inside crystallizes into ice. The longer the freezing process takes, the larger the ice crystals are. Larger ice crystals damage materials by causing phenomena like cell bursting (as shown in the picture below), which affects quality and flavor of foods.

The freezing speed of liquid nitrogen freezer is three to five times faster than conventional freezer. Sizes of the ice crystals formed by liquid nitrogen freezing are much more small, which hardly damage the cell structures of food, thus can preserves food at a higher quality. Even more usefully, once the food is "quick frozen" it can be moved into a normal freezer for longer term storage.



Food Frozen by
Liquid Nitrogen
Freezer

Food Frozen by
Conventional
Freezer



Cabinet Type Freezer

- Each cabinet can be individually controlled, providing greater flexibility;
- Unique "energy saving & pre-cooling" function, lower processing cost;
- Installation is more convenient;
- Especially suitable for large-sized foods, such as whole durians.



Tunnel Type Freezer

- Length and width can be customized;
- Can achieve a high degree of automation;
- Save labor costs;
- Suitable for large batches and continuous operations;

APPLICATION CASES IN FRUITS AND VEGETABLES



Applications Cases

APPLICATION CASES IN FRUITS AND VEGETABLES

SPEEDCRYO



APPLICATION CASES IN MEAT AND POULTRY

SPEEDCRYO



APPLICATION CASES IN MEAT AND POULTRY

SPEEDCRYO



APPLICATION CASES IN SEAFOOD PRODUCTS

SPEEDCRYO



Technological Advantage

- 1) **High speed, high yield**
On earth, liquid nitrogen is a kind of ultra low temperature refrigerant; fast freezing, every minute temperature is reduced to 7 to 15 degrees celsius, the freezing speed is about 30~40 times faster than normal freezing method.
- 2) **High quality**
Liquid nitrogen freezing minimum temperature -196 degrees Celsius, the frozen food can be kept before processing the color, aroma and taste and nutritional value. Reduce water loss, do not reduce weight, keep the original freshness, to improve the quality of products and to improve the rate of output. (More products can also operate).
- 3) **Dry low consumption**
With the low consumption of liquid nitrogen freezing food.
*General freezing equipment, the food consumption rate in 3% ~ 6%,
* Liquid nitrogen freezing equipment, the food consumption rate in 0.6% ~ 1%,

Liquid nitrogen treatment is more suitable for containing high moisture foods, such as tomatoes, red bayberry, crab etc.
- 4) **Antioxidant ,the number of bacteria is less**
• The gas generated in the use of quick frozen in liquid nitrogen is inert nitrogen, the nitrogen in the production process of cut off the air to protect the quality of the food, there is almost no discoloration and fat rancidity. Meanwhile, due to fast freezing, have a good effect on the isolated bacteria.
- 5) **Simple operation**
The operation is simple and convenient, the operation management fee less. Full automatic, unmanned operation, easier access to the existing production line.
- 6) **Low maintenance costs**
Disposable equipment less capital investment, low operation cost, easy to realize mechanization and automation line, improve productivity. The area is relatively small.
- 7) **Less power consumption**
In order to achieve a better preservation effect , device using liquid nitrogen refrigeration and internal energy change, ordinary refrigeration system, freezing consumes a lot of electricity to drive the mechanical refrigeration , so in the refrigeration principle, nitrogen refrigeration isn't required to direct power consumption.
- 8) **The equipment has the advantages of simple structure, safe and reliable, the equipment costs less, long service life. The design can also minimize the amount of consumption of liquid nitrogen. By the analysis we can know: The moving parts of the whole device contains only two devices, is the movement mechanism of the conveyor belt and the simple axial flow fan. The general structure of refrigeration system is complex.**
- 9) **Clean, reduce the cleaning time**
The freezing box is composed of adiabatic plate assembly and the inner and outer guard plate of stainless steel. It is easy to disassemble and easy cleaning, re-assembly is simple and convenient, the conveyor belt is stainless steel structure, cleaning is also more convenient.
- 10) **No pollution, green environmental protection** Because of the freezing process without common refrigeration system CFC refrigerant, so there is no damage to the ozone layer. At present, the international restrictions and prohibit the use of CFC, the characteristics of liquid nitrogen refrigeration equipment without CFC refrigerant is particularly prominent, has a positive role in promoting the development and application of the device, is the trend of the development of refrigeration equipment.
- 11) **Longer shelf life**
The shelf life of food by liquid nitrogen freezing is 1~3 times of the traditional frozen.



Way forwards

Strengthening of intra-regional
infrastructure linkages



Q&A





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THANK
 YOU