

Novel Coronavirus prevention and control Technology Guide for cold chain food production and management

1. Basis and application scope

To standardize and guide the production and operation of cold-chain food during the Novel Coronavirus prevention and Control, and prevent food and food packaging materials from being contaminated by coronavirus, with reference issued by the State Council "COVID - 19 prevention and control guide on the meat processing enterprises" (Joint Prevention and Control Mechanism General Development [2020] No. 216), "COVID (trade) - 19 of epidemic prevention and control technology guide on market (Joint Prevention and Control Mechanism General Development (2020) No. 223), "COVID - 19 virus prevention and control scheme (seventh edition) (Joint Prevention and Control Mechanism General Development (2020) No. 229). And relevant national food safety standards and documents such as COVID-19 and Food Safety: Guidance for Food Enterprises (April 2020) issued by the Food and Agriculture Organization of the United Nations/World Health Organization, this guide is formulated.

This guide is applicable to novel Coronavirus contamination prevention and control in the production, loading and unloading, transportation, storage and sales of cold chain foods that are processed by freezing or refrigeration and are always in low temperature from delivery to sale.

Focusing on the prevention of novel coronavirus infection, this guide highlights the prevention and control of key links such as loading, unloading, storage and transportation, and focuses on the cleaning and disinfection of cold chain food packaging. It is a prerequisite for the application of this guide that producers and traders should strictly abide by laws and regulations and relevant national food safety standards, and enforce local authorities' regulations on COVID-19 epidemic prevention and control.

2. Novel Coronavirus prevention and control health management of practitioners

Health of practitioners is essential to prevent novel Coronavirus from contaminating cold chain foods. Producers and operators involved in the production, handling, transportation, storage, sales and catering services of cold chain food shall adjust and update their health management system according to the COVID-19 epidemic prevention and control requirements, and add the novel Coronavirus prevention and control management measures.

2.1 Establish a health registration system for employees on duty

Producers and operators of cold chain food shall register the travel and health status of employees (including new employees and temporary workers) within 14 days, establish health CARDS for employees on duty, and master the flow and health status of employees. Encourage new employees to volunteer for nucleic acid testing before starting work.

2.2 Daily health monitoring of employees

Producers and marketers of cold-chain food shall strengthen personnel access management and health monitoring, establish a health status and risk exposure information reporting system for all employees, set up temperature measurement points at the entrance to food production and marketing areas, implement prevention and control measures such as registration, temperature measurement, disinfection and health code inspection, and implement the "green code" system.

2.3 Registration and management of foreign personnel

To minimize the number of foreign personnel entering the production and business area, if they really need to enter, they should be inquired about their work units, health status and living area, take measures such as registration and temperature measurement, and take personal protection (such as wearing a mask) according to the requirements. Guards, staff and drivers should avoid unnecessary contact when vehicles are entering or leaving.

2.4 Health requirements for employees

2.4.1 Going to work in good health. Before starting to work, make sure that you are in good physical condition, report health information to the operators, and take the initiative to accept the temperature test from the operators. If you have symptoms such as fever, dry cough and fatigue, immediately take the initiative to report and seek medical advice in time.

2.4.2 Ensure personal protection. Employees should wear masks, gloves and overalls correctly during work. Work clothes should be kept clean and tidy, cleaned regularly and disinfected when necessary. In addition to working clothes, employees in special positions (fresh slaughtering, cutting workshops, etc.) shall wear waterproof aprons and rubber gloves according to the requirements of protection. Disposable gloves are recommended for food practitioners, but must be changed frequently and wash hands between changes and when not wearing gloves. To avoid secondary contamination of protective equipment, gloves must be changed after non-food-related activities such as manually opening/closing doors and emptying bins.

2.4.3 Pay attention to personal hygiene. Cover your nose and mouth with a tissue or elbow when sneezing or coughing. Do not spit everywhere, pay attention to hygiene when you blow your nose. Avoid touching your mouth, eyes or nose with your hands.

2.4.4 Strengthen hand hygiene. Wash your hands under running water with hand sanitizers or soap, or rub your hands with quick-drying hand sanitizers when handling goods or when your hands touch common items such as shelves and handrails.

2.5 Establish a health reporting procedure

If an employee or a co-resident finds that he/she has fever, dry cough, fatigue or other suspected symptoms, he/she shall report to the top manager of the producer or operator in a timely manner, and shall report to the top manager step by step or directly as the case may be. Operators should take effective measures to exclude employees and their close contacts from the food working environment as soon as they find employees with the above abnormal health symptoms, no matter what their health status is. In areas at high risk of COVID-19 transmission, it is recommended

that healthy staff be required to report "zero" in accordance with local authorities' prevention and control regulations.

2.6 Procedures for the returning employees

According to the registration and health records of employees in the production and business area, timely track the treatment and rehabilitation status of employees with health abnormalities, physical discomfort, suspected or infected with a Novel Coronavirus (patient or asymptomatic infected person), and scientifically assess whether they meet the conditions for returning to work after recovery. If the symptoms of a confirmed COVID-19 case have subsided and two nucleic acid PCR tests at least 24 hours apart are negative, the isolation can be removed; In cases where testing is not possible, the patient can be released from isolation and returned to work 14 days after the symptoms subside. Employees who have close contacts with COVID-19 patients should also meet the above control requirements before returning to work.

2.7 Strengthen the publicity of prevention and control knowledge

Various forms of health education will be conducted to guide practitioners to master knowledge and skills related to the prevention and treatment of COVID-19 and other respiratory infectious diseases, develop good hygiene habits and strengthen their awareness of self-protection.

3. Prevention and control requirements during loading, unloading, storage and transportation

3.1 Health requirements for stevedoring workers

In addition to general personal hygiene requirements, work clothes and hats should be worn before handling the goods. Disposable medical masks or surgical masks and gloves should be used. Goggles and face screens should be worn when necessary to avoid frequent contact with the body surface of the goods.

In particular, when loading and unloading imported cold chain foods from areas with epidemic outbreaks, dock porters and others should wear masks in the whole process of handling the goods to avoid touching the face or touching the mouth and nose of the goods, or touching the frozen aquatic products possibly contaminated by novel Coronavirus. If the mask is damaged during handling, it should be replaced immediately.

3.2 Hygiene requirements for transport driver

In addition to the hygiene requirements of the employees, personnel transporting cold chain food (drivers and attendants) shall not unpack the boxes without authorization, and shall not open the cold chain food packaging at will and directly touch the cold chain food. When vehicles are entering or leaving, drivers and attendants shall avoid having unnecessary contact with guards and staff.

3.3. Health management at the source of goods

For imported cold chain food, importers or shippers shall cooperate with relevant departments to sample and test the food and its packaging. For exotic food, the distributor shall take the initiative to ask the supplier for relevant food safety and epidemic prevention test information. For local meat slaughtering, processing and marketing enterprises, the relevant quality management and operation standards for cold chain food shall be strictly implemented and environmental hygiene management shall be strengthened. If the importer or consignor entrusts the third-party logistics company to provide transportation, warehousing and other services, it shall take the initiative to provide the third-party logistics company with the testing information needed for food safety and epidemic prevention when the goods are delivered to the third-party logistics company.

In the process of cold chain logistics, if the logistics package needs to be equipped with supports or liners, it shall meet the relevant food safety and hygiene requirements. The temperature conditions for storage and transportation of cold chain food shall be indicated on the logistics package. We should strengthen the management of cargo handling operations, so that the goods do not touch the ground directly and the cold-chain food packaging cannot be opened at will. It shall ensure that the temperature of cold-chain food is always within the allowable fluctuation range during transportation, storage, sorting, etc. Record and keep the time, temperature and other information of each delivery link.

3.4 Vehicle hygiene management

It shall ensure that the interior of vehicle compartments is clean, non-toxic, harmless, odorless and pollution-free, and carry out regular preventive disinfection. Please refer to the novel Coronavirus Prevention and Control Technical Guide for specific disinfection measures in the production and operation of low temperature cold chain food.

3.5 Sanitary management of storage facilities

The loading and unloading area of the warehouse should be equipped with a closed platform and a sealed device for docking with refrigerated transport vehicles. In addition to the appearance and quantity of the double combination of the cold chain, the central temperature of the cold chain food should also be checked. The storage management in the storehouse should be strengthened. The stacking of cold chain food should be placed on pallets or shelves according to regulations. Cold chain food should be put in different storehouses or in different storehouses according to their characteristics. Cold chain food with different requirements on temperature and humidity and easy to cross contamination should not be mixed. The temperature and humidity in the warehouse shall be checked periodically and shall meet the storage requirements for cold-chain food and be kept stable. Clean and disinfect the internal environment, shelves and operating tools of the warehouse on a regular basis. For specific cleaning and disinfection measures, please refer to the novel Coronavirus Prevention and Control Disinfection Technology Guide for cold-chain Food Production and business.

4. Prevention and control requirements in production and processing

4.1 Personnel health requirements

Carry according to 2.4 requirements.

4.2 Keep a safe distance

Keep at least 1 meter distance between employees. The feasible measures to keep distance in the food processing environment include: setting the workbench only on one side of the production line, dislocation production or assembling the baffle in the middle of the production line, etc., to prevent employees from facing each other; Strictly limit the number of employees in the food preparation area and exclude all non-essential personnel; Divide employees into working groups or teams, while reducing communication and interaction between working groups.

4.3 Incoming protection and inspection

4.3.1 Loading and unloading protection. Loading and unloading workers who need direct contact with cold-chain food goods should wear work clothes and hats, disposable medical masks or disposable surgical masks, gloves, etc., and wear goggles and face screens when necessary to avoid frequent contact with the surface of the goods.

4.3.2 Source control. Cold chain food enterprises shall conduct supplier compliance inspection and assessment, conscientiously conduct inspection and verification of each batch of food purchased, truthfully record and keep information such as incoming inspection of food and raw materials, ex-factory inspection and food sales in accordance with the law to ensure food traceability. The retention period of records and vouchers shall be not less than 6 months after the expiration of the product warranty period, or not less than 2 years if the warranty period is not specified.

4.3.3 Inspection certificate. For imported cold chain food, importers or shippers shall cooperate with relevant departments to sample and test the food and its packaging. For exotic food, the distributor shall take the initiative to ask the supplier for relevant food safety and epidemic prevention test information.

4.4 Cleaning and disinfection

See "Novel Coronavirus Prevention and Control Disinfection Technique Guide for Cold chain Food Production and Business".

4.5 Other protective measures

4.5.1 Ventilation requirements. Natural ventilation is preferred in general factory areas, and mechanical ventilation can be supplemented if conditions are not available. The closed factory shall maintain safe indoor air circulation and air conditioning system supply. Air conditioning and ventilation systems shall be inspected, cleaned and disinfected regularly to ensure clean and safe operation.

4.5.2 Water supply and drainage facilities. Sewers should be well maintained and kept open. Floor flushing faucets and disinfection facilities shall be provided for the flushing and disinfection of sewage. The discharge of sewage shall comply with the relevant provisions.

5. Prevention and control requirements for sales and operation process

Centralized cold-chain food trading markets (wholesale markets of agricultural products, farmers' markets, community vegetable markets), supermarkets, convenience stores, restaurants, self-run e-commerce and other food operators shall have appropriate refrigeration and freezing facilities.

5.1 Personnel health requirements

See 2.4 requirements. In addition to working clothes, food operators at special stalls such as fresh slaughter also need to wear waterproof aprons and rubber gloves.

5.2 Keep a safe distance

The number of customers entering the cold-chain food sales area should be controlled in a reasonable way, so as to avoid gathering and crowding. The distance between people should be kept at least 1 meter, and the enclosed space should be increased moderately. Measures such as using ground markings to guide and manage orderly queues can be used to keep customers at a distance, especially in crowded areas such as service desks and cash registers.

5.3 Cleaning and disinfection

See "Novel Coronavirus Prevention and Control Disinfection Technique Guide for Cold chain Food Production and Business".

5.4 Warning

5.4.1 Set up a sign at the entrance that requires customers not to enter the store if they are in abnormal health, are not well or have novel Coronavirus suspected symptoms.

5.4.2 Regularly broadcast or post notices in the cold chain food retail areas (stores, stores, supermarkets) to remind customers to keep a distance and keep their hands clean in time. If consumers bring their own shopping bags, it is suggested that they should wash the cold chain food before using it.

5.5 Other protective measures

Glass barriers are placed at checkout counters and counters to encourage contactless payments to reduce contact. Consideration should be given to not publicly displaying or selling unpackaged cold chain foods at self-service counters.

6. Prevention and control requirements in catering processing

To prevent and control novel Coronavirus contamination involving cold chain food and beverage service, food and beverage service operators should pay attention to the following prevention and control requirements.

6.1 Personnel health requirements

See 2.4 requirements.

6.2 Keep a safe distance

6.2.1 Use appropriate measures to prevent overcrowding and keep at least 1 meter distance between food practitioners.

6.2.2 In-class seating shall be arranged at a safe social distance.

6.2.3 The use of ground markers in the store is convenient for customers to keep a distance, especially in crowded areas, such as the service desk and cashier desk.

6.3 Cleaning and disinfection

See "Disinfection Technology Guide on Novel Coronavirus prevention and Control during Cold chain food production and management process".

6.4 Other protective measures

6.4.1 Provide cleaning disinfectant. Provide hand sanitizers for employees and consumers entering and leaving the dining area.

6.4.2 Prevent cross contamination. Raw and cooked food shall be processed and stored separately, and the utensils used for handling uncooked food shall be fully disinfected before they can be placed or processed on cooked food.

6.4.3 Avoid unnecessary physical contact. Encourage mobile contactless payment, contactless delivery, etc.

6.4.4 Maintain good air circulation and open Windows frequently for ventilation.

6.4.5 Provide cooked food whenever possible. During an epidemic, food should be heated adequately.

6.4.6 Catering services shall advocate the use of separate meals, and public chopsticks shall be provided if they cannot be served separately.

7. Emergency response measures in relevant areas

Cold chain food producers and traders shall formulate emergency response plans for coVID-19 epidemic to timely handle and report the epidemic situation and effectively prevent the novel Coronavirus from spreading.

7.1 Emergency treatment for people with abnormal health conditions

Cold-chain food production or marketing related area, if once detected or suspected abnormalities persons in COVID - 19, it must implement the non-proliferation and the prevention and control measures, cooperate with related departments to carry out epidemiological investigations, tracing management on close contact, disinfection work, and carry out sample test and nucleic acid detection on the area of person worked and the cold-chain food he/she processed. If there is an air conditioning and ventilation system, it should be cleaned and disinfected at the same time. After evaluation, it can be restarted. Depending on the severity of the outbreak, work areas will be temporarily closed until the outbreak is under control and production will resume.

Measures should be taken to cut off transmission routes and isolate close contacts in accordance with COVID-19 prevention and control requirements, and pollutants should be disposed of in accordance with regulations.

7.2 Emergency disposal upon finding positive sample accounting test

Upon receipt of a notice of novel Coronavirus nucleic acid test positive sample, operators of cold-chain foods shall immediately start their contingency plans and timely take emergency disposal of relevant articles and environment under the guidance of professionals according to local requirements, including temporary sealing and harmless treatment of relevant articles, disinfection of work areas, timely nucleic acid testing and health screening of potential contacts and other measures.

Before the articles are disposed of, the refrigerating equipment such as refrigerators, freezers and freezers shall be kept in normal operation to prevent the articles from corrupting or deteriorating and the possible diffusion of pollutants. Avoid spilling of goods during transportation when dealing with related items. Personnel involved in the cleaning and transportation of relevant articles shall take good personal protection.

Nucleic acid positive products shall be disposed of in accordance with the requirements of the local competent authorities.

Disinfection Technology Guide on Novel Coronavirus prevention and Control during Cold chain food production and management process

1. Basis and application scope

To standardize and guide the production and operation of cold-chain food from the novel Coronavirus prevention and control , and prevent food and food packaging materials from being contaminated by coronavirus, with reference to the COVID-19 Epidemic Prevention and Control Guidelines for Meat Processing Enterprises issued by the Joint Prevention and Control Mechanism of the State Council (Joint Prevention and Control Mechanism General Development [2020] No. 216), " Urgent notice on strengthening the work of cold chain food novel Coronavirus nucleic acid test, (Joint Prevention and Control Mechanism General Development (2020) No. 220), " COVID (trade) - 19 of epidemic prevention and control technology guide on market (Joint Prevention and Control Mechanism General Development (2020) no. 223), "COVID - 19 virus prevention and control scheme (seventh edition) (Joint Prevention and Control Mechanism General Development (2020) no. 229), and relevant national food safety standards and documents such as COVID-19 and Food Safety: Guidance for Food Enterprises (April 2020) issued by the Food and Agriculture Organization of the United Nations/World Health Organization, this guide is formulated.

This guide is applicable to the frozen, refrigerated cold-chain food remain the state of low temperature from factory to sales. It is used to guide the disinfection of cold chain food from COVID-19 high-risk areas at home and abroad during the production, handling, transportation, storage and sale of food production and marketing units and individuals in normal operation during the normalization period of COVID-19 prevention and control.

It is a prerequisite for the application of this guide that relevant entities and individuals in food production and marketing should strictly abide by laws and regulations and relevant national food safety standards, and enforce local authorities' regulations on COVID-19 epidemic prevention and control.

2. Cleaning and disinfection during production and processing

During the production and processing of cold chain food, effective cleaning and disinfection systems shall be formulated for the processing personnel, production environment and related equipment and facilities according to the characteristics of food raw materials and products as well as production and processing technology, and the implementation and effect of disinfection measures shall be regularly evaluated.

2.1 Food production and processing personnel

Food production and processing personnel entering the working area shall ensure their

health, meet the relevant requirements for personal protection, and regularly disinfect their hands with an alcohol-based sanitizer.

2.2 Outer packing of raw materials and semi-finished products

2.2.1 The outer packing of cold chain food raw materials and semi-finished products from high-risk COVID-19 regions (countries) should be strictly and effectively disinfected before they enter enterprises or are put into storage.

2.2.2 The tools (such as transfer boxes, spoons, pliers, etc.) used for transporting raw materials or semi-finished products of cold chain food shall be cleaned and disinfected in time after each use.

2.2.3 For food raw materials and semi-finished products tested contaminated by a novel Coronavirus, they shall be handled in accordance with the Guidelines of "Novel Coronavirus Nucleic acid Positive Food Disposal" (No. 220 of the Joint Prevention and Control Mechanism) in the "Urgent Notice on Strengthening the Work of Nucleic acid testing by Coronavirus in a cold chain".

2.3 Production and processing equipment and environment

2.3.1 Equipment and Appliances. Before production and processing, appliances used after processing shall be placed separately and properly kept to avoid cross-contamination. The novel Coronavirus should be effectively cleaned and sterilized after production (or when necessary during the production process) and the sterilizing procedures and disinfectants selected should effectively kill the novel Coronavirus.

2.3.2 Environment. Increase the frequency of disinfection in the high-risk areas including the workshop environment of each link of processing of raw materials of cold chain food, the workshop environment of each link of production of ready-to-eat and cooked food, cold storage and other high-risk areas. The environment shall be thoroughly cleaned and disinfected during and after the production and processing. In particular, the frequency of cleaning and disinfecting all kinds of operating tables, contact surfaces/points (such as door handles, switches, appliance handles, telephones, toilets, etc.) and crowded environments shall be strengthened in the production and processing.

2.3.3 for all kinds of meat, aquatic products, egg products and other foods that are rich in protein and fat, because of the stain is easy formed in the contact surface and not easy to be removed, and its production and processing environment is generally low temperature, big humidity. In order to improve the disinfection effect, minimize use of disinfectants, shorten the disinfectant and the effect of time on the surface of the object, all containers, equipment and contact surface of meat, aquatic products, egg products and other foods that are rich in protein must be thoroughly cleaned before disinfection.

2.3.3.1 Selection of detergent

Common cleaning agents for food processing equipment and environment include basic solution, salt solution (such as phosphate, carbonate, silicate), acid solution (such as citric acid, phosphate) and synthetic detergent (such as anion, cation, non-ionic alkali detergent). Among them alkaline solution is the most commonly used cleaning solution in meat, aquatic products and egg products processing environment.

In addition, various synthetic detergents can also effectively remove meat deposits, fat and dirt, and should be used at an appropriate temperature to make it fully in contact with the surface to be cleaned and kept for a certain time before rinsing with water. Another way to saponify fats for easy cleaning is to combine proteases that break down proteins with a low-concentration base solution to make proteases solution. Due to the enzyme in high pH, high temperature will be inactivated, so the configuration of the enzyme solution temperature and pH moderate, can greatly reduce the treatment of cleaning surface corrosion.

2.3.3.2 Cleaning procedures

- (1) In order to save detergent and water, first remove the dirt on the surface by physical method.
- (2) Further flush out the dirt with water. In order to reduce the production of aerosol, high-pressure water should not be used.
- (3) Apply alkaline solution or synthetic detergent/enzyme solution with a temperature of 50-55°C to the surface to be cleaned. After 6-12 minutes of contact, clean and wipe the surface to be cleaned. To make the cleaner in full contact with the surface to be cleaned, it is best to use foaming detergent for vertical surface cleaning.
- (4) Rinse off alkali solution or detergent with clean water.
- (5) Alkali solution cannot remove scale or rust. Acid (such as phosphoric acid, hydrochloric acid or organic acid such as citric acid and gluconic acid) can be used to remove scale or rust.

2.3.3.3 disinfection

- (1) In order to improve the disinfection effect and prevent the disinfectant from reducing its activity due to insufficient contact with the object surface, the equipment or environmental surface to be disinfected must be thoroughly cleaned in accordance with the above procedures before disinfection. Commonly used disinfectants include fluoride, iodine or quaternary ammonium salt solutions.
- (2) Whether a disinfected surface needs cleaning depends on the disinfectant used. Quaternary ammonium salt disinfectants can remain on the equipment for a long time, so both quaternary ammonium salt and iodine disinfectant should be thoroughly rinsed with water after use.
- (3) If the surface of the equipment is corroded after disinfection, it can be oiled to protect the corroded area. If the oil is of food grade, it needs not be removed. If it is of non-food grade, the oil should be removed before the next processing shift begins.
- (4) The in-situ cleaning method is used to continuously clean the moving conveyor belt and other parts of the production and processing equipment.

3. Clean and disinfect the transportation and distribution process

3.1 personnel

During the distribution of cold chain food, drivers and transportation attendants should maintain personal hand hygiene, and their vehicles should be equipped with alcoholic hand sanitizer, disinfectant and paper towels, so as to ensure that hand sanitizers are carried out regularly when hands are washed without clean water.

3.2 Object surface

Drivers should wash their hands or disinfect distribution documents before handing them over to other staff. To avoid cleaning the returned items, it is better to store the documents in disposable containers and packaging materials. Containers used repeatedly shall be cleaned and disinfected regularly and appropriately.

Surfaces that are most likely to be contaminated with the virus, such as steering wheels, door handles and mobile devices, are frequently touched by hand, should be disinfected regularly.

3.3 Transportation

To avoid contamination of cold chain food, drivers should ensure that transport vehicles, handling tools and containers are cleaned and disinfected regularly. When goods are mixed, the vehicles should be loaded with food as far as possible apart from other goods that cause pollution. Before and after a shipment of goods is carried on a vehicle, all parts of the vehicle that may be touched by human hands, especially inside and outside the vehicle, should be thoroughly disinfected.

4. Cleaning and disinfection during sales and operation

4.1 Employees in cold-chain food sales and operation areas should maintain good hygienic operation and wash hands frequently with hand sanitizer to keep personal hands clean and hygienic.

4.2 Timely clean and disinfect all kinds of surfaces, handles (such as door handles, handles for refrigeration equipment, handles for containers, handles for carts, etc.) and buttons (such as buttons for calculators and electronic weighing equipment, etc.) that are frequently touched by hands. After the completion of daily operations, the business area shall be thoroughly disinfected.

4.3 Convenient for customers to wash their hands for disinfection. In-store hand-washing facilities should be maintained in good working order and equipped with quick-drying hand sanitizers; when conditions allow, it can be equipped with inductive hand disinfection facilities.

5. Clean and disinfect the food and beverage process

5.1 The catering industry shall regularly clean and disinfect all cold chain food contact surfaces, outer packing and utensils, and strengthen the cleaning and disinfecting of food (drink) utensils and condiment containers.

5.2 Disinfect high-frequency contact surfaces, clean and disinfect various equipment, areas, contact surfaces/high-frequency contact points (such as countertops/clamps/service appliances/open self-service display stands/door handles), garbage cans, sanitary ware, etc., at a higher frequency. At the same time, increase the frequency of cleaning and disinfection of work clothes.

5.3 Ensure that the in-store hand-washing facilities operate normally and are equipped with quick-drying hand sanitizer; when conditions allow, it can be equipped with inductive hand disinfection facilities.

6. Common disinfectants used in production and marketing and their application

methods

The commonly used disinfectants and application methods in the production and marketing of cold chain food are shown in the attached table.