



**THAI AGRICULTURAL STANDARD**

**TAS 9041-2014**

**CODE OF PRACTICE  
FOR THE MANUFACTURING OF  
QUICK FROZEN AGRICULTURAL COMMODITIES**

**National Bureau of Agricultural Commodity and Food Standards  
Ministry of Agriculture and Cooperatives**

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**50 Phaholyothin, Chatuchak, Bangkok 10900**

**Telephone 0 2561 2277 Facimile 0 2561 3357**

**[www.acfs.go.th](http://www.acfs.go.th)**

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**Technical Committee on the Elaboration of Thai Agricultural Standard for Code of Practice for the Manufacturing of Quick Frozen Foods**

- |                                                                                                                              |                      |
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(3)

Temperature control during manufacturing, storage and transportation of quick frozen agricultural commodities is the basis for the processing of safe and quality products. The Agricultural Standards Committee therefore deems it necessary to establish the standard for Code of Practice for the Manufacturing of Quick Frozen Agricultural Commodities in order to provide guidance for those involved in the manufacture, storage and transport of quick frozen agricultural commodities, which earn huge amount of export value for Thailand.

This standard is based on the following documents:

FAO/WHO. 1976. Code of Practice for the Processing and Handling of Quick Frozen Foods (CAC/RCP 8-1976, Rev.3-2008). Joint FAO/WHO Food Standards Programme, FAO, Rome.

FAO/WHO. 2003. General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 4-2003). Joint FAO/WHO Food Standards Programme, FAO, Rome.

**THAI AGRICULTURAL STANDARD**  
**CODE OF PRACTICE FOR**  
**THE MANUFACTURING OF QUICK FROZEN AGRICULTURAL COMMODITIES**

**1. SCOPE**

This agricultural standard establishes code of practice for the manufacturing of the following quick frozen agricultural commodities:

- Meat and meat products
- Other animal produce, excluding ice-creams
- Fish and fishery products
- Cereals, fruits, and vegetables and their products
- Combination thereof

The standard covers the activities from raw material receiving, preparing, processing, handling, storing to transporting of the quick frozen agricultural commodities, which are used as food or raw materials for further processing.

**2. DEFINITIONS**

For the purpose of this standard

2.1 Quick frozen agricultural commodity means agricultural commodity which has been subjected to quick temperature decreasing process until the thermal centre of product is at  $-18^{\circ}\text{C}$  or colder and maintains such temperature at all steps including transport, subject to permitted temperature tolerances.

2.2 Temperature tolerance means short term fluctuations of temperature of the quick frozen agricultural products during steps from manufacturing to transporting. The fluctuations, nonetheless, shall be within the limits permitted in this standard and do not affect the safety and quality of products.

### 3. REQUIREMENTS

Requirements are as in Table 1.

**Table 1 Requirements for the manufacturing of the quick frozen agricultural commodities  
(Section 3)**

Items	Requirements
1. Establishment (1) Location	1.1 Locate in the area that poses no risk of contamination causing any adverse effect to the safety and quality of quick frozen agricultural commodities. If there is a risk, preventive measures shall be in place.
(2) Plant and production flow	1.2 Design plant and production flow for rapid processing, freezing and storage of agricultural commodities. 1.3 Design plant and production flow to prevent cross-contamination that otherwise can have adverse effect on the safety and quality of quick frozen agricultural commodities. 1.4 Building shall be strong, easy to clean and maintain
(3) Cold store for quick frozen agricultural commodities	1.5 Walls, floor, ceiling, and doors shall be properly insulated in order to maintain a steady product temperature of -18°C or colder with a minimum fluctuation. 1.6 Design cold store to allow adequate air flow around the stored product. 1.7 Availability of preventive measures against loss of cold air as well as leaks of any refrigerant. In case of any leak, immediate corrective measures shall be applied. 1.8 Availability of system and equipment to control and record temperatures on a regular basis.
(4) Tools and equipment	1.9 Design tools and equipment not to damage or cause contamination to raw materials or products. 1.10 Design tools and equipment for easy cleaning and maintenance. 1.11 Adequate number of tools and equipment that are ready to use. 1.12 Design freezer, tools and equipment that operate properly and precisely.
(5) Facilities	1.13 Availability of a contingency plan in the case of power loss or equipment failure in order to maintain the product temperature within the required range. 1.14 Availability of adequate drainage and waste disposal systems in the plant and production area in a hygienic manner. 1.15 Availability of adequate cleaning facilities. 1.16 Availability of adequate personal hygiene facilities and toilets for the personnel involved in the production process. 1.17 Availability of adequate ventilation, not to cause condensation inside the working building. 1.18 Availability of adequate lighting with appropriate source of suitable light for such necessary operation. 1.19 Lighting fixtures, including other fragile tools or structure, shall be protected to ensure that quick frozen agricultural commodities are not contaminated by breakages.

Items	Requirements
	1.20 Availability of appropriate facilities for the orderly storage of raw materials, packaging materials, other processing related materials, tools and equipment, and chemicals.
<b>2. Control of Operation</b> (1) Water	2.1 Sufficient supply of clean water, drinking water and/or ice with suitable quality for the purposes of uses and in compliance with the relevant laws and regulations.
(2) Management and supervision	2.2 Availability of operation control system with appropriate numbers of competent supervisors. 2.3 Availability of proper work procedures for the operations and monitoring.
(3) Traceability and recall	2.4 Availability of procedure document for traceability and recall to ensure timely withdrawal of quick frozen agricultural commodities that may pose risk to consumer health. 2.5 The production lot shall be identified on the label or accompanying document of the product for traceability. 2.6 Availability of food safety monitoring plan and implement accordingly.
<b>3. Control of processing, storage and transport</b> (1) Raw material (1.1) Receiving and storage	3.1 Availability of raw material receiving system to ensure safety and quality of incoming material as required by the processors. For highly perishable raw material, temperature shall be carefully controlled and monitored. 3.2 Raw materials shall be stored in an appropriate duration and temperature of their types.
(1.2) Raw material preparation	3.3 Sort and cull of inappropriate raw material from the processing system. 3.4 Control duration and temperature during raw material preparation appropriately.
(2) Processing before freezing	3.5 For raw materials that require thawing, the method shall be defined in a hygienic and appropriate manner. The time and temperature of the thawing process shall be carefully monitored. 3.6 For raw materials that require blanching, such as vegetables, time and temperature schedules for blanching shall be properly controlled. 3.7 For raw materials that require pre-cooking, time and temperature schedules shall be properly controlled to ensure sufficient inactivation or reduction of pathogens to the safe level. 3.8 Time of raw materials spent in the critical temperature zone, i.e. between 10°C and 60°C, shall be controlled to be as short as possible, where appropriate.

Items	Requirements
(3) Quick Freezing process	<p>3.9 Design freezing process to achieve rapid decrease of the temperature at the thermal centre of raw materials to prevent growth of pathogenic microorganisms during the process.</p> <p>3.10 The thermal centre of raw materials shall be set to reach at -18°C or colder.</p> <p>3.11 After freezing process, the product shall be quickly moved as soon as possible to cold store and maintain the product temperature at -18°C or colder.</p> <p>3.12 In case of glazing, water used shall be drinking water or of equivalent quality.</p> <p>3.13 Use of food additives shall be in compliance with relevant laws and regulations or standards.</p>
(4) In case of helminth parasite control	<p>3.14 For products intended for raw consumption or not fully cooked prior to consumption, the measures applied shall be clearly defined freezing temperature and duration of product holding in the frozen state to ensure effective control of such parasite.</p>
(5) Packaging	<p>3.15 Package shall be clean and not cause any contamination that could adversely affect the safety and quality of product.</p> <p>3.16 Packaging process shall be quickly carried out, not to cause temperature increase higher than the permitted tolerances and does not adversely affect the safety and quality of product.</p> <p>3.17 Packaging method shall protect quick frozen agricultural commodities against dehydration.</p> <p>3.18 Packaging method shall protect quick frozen agricultural commodities against microbial and other contaminations.</p>
(6) Storage of quick frozen agricultural commodities	<p>3.19 Control cold store temperature to maintain the product temperature of -18°C or colder with a minimum of fluctuation laid within the temperature tolerance.</p> <p>3.20 Arrange products in the cold store properly to prevent any contamination and not to impede air circulation to the extent that the product temperature is adversely affected.</p> <p>3.21 Manage quick frozen agricultural commodities to ensure the basis of “first in-first out” or shortest durability date. In no case, should products be stored beyond their specified shelf-life.</p>
(7) Moving and transport	<p>3.22 Movement of products between transfer points in the plant, including loading into and unloading from cold store, shall be carried out hygienically and quickly to minimize the exposure to humidity and temperature warmer than -18°C or other adverse conditions that will jeopardize the safety and quality of product.</p> <p>3.23 Vehicle compartments shall be able to maintain the product temperature of -18°C or colder from the beginning of transport to the final destination.</p> <p>3.24 Check cleanliness of the vehicle compartments prior to loading.</p>



Items	Requirements
	<p>3.25 Set and pre-cool vehicle compartments prior to loading</p> <p>3.26 Loading and unloading shall be carried out as quickly as possible using suitable methods</p> <p>3.27 Control the temperature of the quick frozen agricultural commodities during transport not to be warmer than -18°C or keep to a minimum within the set limit and, in all cases the product temperature shall not be warmer than -12°C. In addition, the product temperature shall be reduced to -18°C as soon as possible.</p> <p>3.28 Availability of temperature inspection plan, implement and record the product temperature during transport.</p>
(8) temperature monitoring	<p>3.29 Availability of appropriate measures for temperature monitoring during the freezing process and along the steps from processing to transport to ensure the product temperature is maintained at -18°C or colder. If the temperature is deviated, there shall be within the temperature tolerances.</p> <p>3.30 The selection of temperature monitoring equipment shall take into account:</p> <ol style="list-style-type: none"> <li>1) appropriate accuracy and resolution</li> <li>2) coverage of temperature range adequate for quick frozen agricultural commodities</li> </ol> <p>3.31 Availability of calibration plan, implement and record the calibration and/or verification of temperature monitoring equipment to ensure proper functioning.</p>
(9) Management of temperature violated product	<p>3.32 Immediately specify and sort out the quick frozen agricultural commodities that their temperatures are higher than permitted limits. Firstly, suspend sales and assess by the responsible person the safety and quality of product and then take the following action accordingly</p> <ol style="list-style-type: none"> <li>1) unsafe product shall be treated and brought up to the safe level or destroyed</li> <li>2) unqualified product shall be treated and brought up to the standard level before use/sale.</li> <li>3) Record the action as of 1) or 2)</li> </ol> <p>3.33 In case of any safety concern of the product already delivered out of the establishment, the entrepreneur shall inform relevant parties and/or competent authority to recall the product to be treated or destroyed. The action shall be recorded.</p>
<b>4. Maintenance and sanitation</b>	<p>4. Availability of procedural plan, frequency and responsible person; implement; and monitor effectiveness of the process and record the details as follows:</p> <ol style="list-style-type: none"> <li>1) maintenance and repair premises, tools and equipment, cold store, facilities, vehicles, and containers</li> <li>2) cleanliness of premises, tools and equipment, cold store, facilities, vehicle, and container</li> <li>3) prevention and eradication of pests/disease carrier in the establishment, especially in the production and storage areas</li> <li>4) management of rubbish and waste from production area</li> </ol>

Items	Requirements
<b>5. Personal hygiene</b>	<p>5.1 Operators shall maintain personal hygiene</p> <p>5.2 Operators shall dress and work hygienically according to the personal hygiene requirements of the establishment</p> <p>5.3 Operators shall not have contagious diseases or sick that could compromise food safety. In case of having such diseases or sick, the operators shall notify their supervisor.</p> <p>5.4 Visitors entering the working area shall comply with the personal hygiene requirements of the premises.</p>
<b>6. Training</b>	<p>6.1 Availability of training plan of which the operators are trained and evaluated to ensure that they have skills and knowledge appropriate to their responsibility.</p> <p>6.2 Availability of evaluation of work to ensure that operators have understanding and work correctly, especially in the temperature control of the quick frozen agricultural commodities.</p>
<b>7. Record keeping</b>	<p>7.1 Keep records of measurements, monitoring, and operation control longer than the shelf-life of the products but not less than 2 years.</p>