



THAI AGRICULTURAL STANDARD

TAS 9007-2005

**SAFETY REQUIREMENTS FOR
AGRICULTURAL COMMODITY AND FOOD**

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

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

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Inspection and Certification of Agricultural Commodity and Food**

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As Thailand is one of the most important food suppliers all through the world, an ability to produce safe agricultural commodities and food is considered as a main aspect taken into the Royal Thai Government's consideration. Moreover, to be recognized, equivalent, and complied with international level is the other criterion facilitating trade practices. The Ministry of Agriculture and Cooperatives has therefore agreed to elaborate a Thai Agricultural Standard on "Safety Requirements for Agricultural Commodity and Food".

The establishment of this standard is based on international standards and guidelines recommended by international organizations which are the Joint FAO/WHO Food Standards Programme (Codex), International Plant Protection Convention (IPPC), and Office International des Epizootic (OIE). Additionally, the contents exist in the standard are also in accordance with scientific-based information, and importing countries' standards and regulations.

Remark:

The standard title has been revised from "Thai Agricultural Commodity and Food Standard (TACFS)" to "Thai Agricultural Standard (TAS)" in accordance with the enforcement of the Agricultural Standards Act B.E. 2551 (2008).



**NOTIFICATION OF THE NATIONAL COMMITTEE ON
AGRICULTURAL COMMODITY AND FOOD STANDARDS
SUBJECT: THAI AGRICULTURAL COMMODITY AND FOOD STANDARD:
SAFETY REQUIREMENTS FOR AGRICULTURAL COMMODITY AND FOOD
B.E. 2548 (2005)**

The resolution of the 3/2548 session of the national Committee on Agricultural Commodity and Food Standard dated 7 December B.E. 2548 (2005) endorsed the Thai Agricultural Commodity and Food Standard entitled Safety Requirements for Agricultural Commodity and Food for supporting the improvement of the production for safe agricultural commodities and food.

By virtue the Cabinet Resolution on Appointment and Authorization of the National Committee on Agricultural Commodity and Food Standards dated 19 December B.E. 2545 (2002), the Notification on Thai Agricultural Commodity and Food Standard entitled Safety Requirements for Agricultural Commodity and Food is hereby issued as a voluntary standard, the details of which are attached herewith.

Notified on 21 December B.E. 2548 (2005)

Khunying Sudarat Keyuraphan

Minister of Agriculture and Cooperatives

Chairperson of the National Committee on Agricultural Commodity and Food Standards

THAI AGRICULTURAL STANDARD
SAFETY REQUIREMENTS FOR
AGRICULTURAL COMMODITY AND FOOD

1. SCOPE

1.1 This Thai Agricultural Standard applies to be used as a reference for agricultural commodity and food producers to advantages of food safety improvement, trade benefits and consumer's health protection. This standard indicates safety criteria and limits that contribute the inspection and certification schemes on the safety of agricultural commodities and food.

1.2 This standard covers three groups of agricultural commodities and food including their products; namely, plant, livestock, and fish.

2. DEFINITIONS

For the purpose of this standard:

2.1 **Agricultural commodity** means produces or products which are obtained from the production of agriculture, livestock, fishery, or forestry, which is intended for consumption or processing to be food.

2.2 **Food** means any substance, whether processed, semi-processed or raw, which is intended for human consumption, and includes drink, chewing gum and any substance which has been used in the manufacture, preparation or treatment of "food" but does not include cosmetics or tobacco or substances used only as drugs.

2.3 **Low-acid food** means any food, other than alcoholic beverages, where any component has a pH value greater than 4.6 and water activity greater than 0.85.

2.4 **Acidified low-acid food** means a food which has been treated so as to attain an equilibrium pH of 4.6 or lower after heat processing

2.5 **Hermetically sealed containers** means containers which are sealed to protect the contents against the entry of microorganisms during and after heat processing

2.6 Pesticide means any substance intended for preventing, destroying, attracting, repelling, or controlling any pest including unwanted species of plants or animals during the production, storage, transport, distribution and processing of food, agricultural commodities, or animal feeds or which may be administered to animals for the control of ectoparasites. The term includes substances intended for use as a plant growth regulator, defoliant, desiccant, fruit thinning agent, or sprouting inhibitor and substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport. The term normally excludes fertilizers, plant and animal nutrients, food additives, and animal drugs.

2.7 Pesticide residue means any specified substance in food, agricultural commodities, or animal feed resulting from the use of a pesticide. The term includes any derivatives of a pesticide, such as conversion products, metabolites, reaction product, and impurities considered to be of toxicological significance.

2.8 Veterinary drug means any substance applied or administered to any food producing animal, such as meat or milk producing animals, poultry, fish or bees, whether used for therapeutic, prophylactic or diagnostic purposes or for modification of physiological functions or behaviour.

2.9 Residues of veterinary drugs include the parent compounds and/or their metabolites in any edible portion of the animal product, and include residues of associated impurities of the veterinary drug concerned.

2.10 Contaminant means any substance not intentionally added to food, which is present in such food as a result of the production (including operations carried out in crop husbandry, animal husbandry and veterinary medicine) manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food or as a result of environmental contamination. The term does not include insect fragments, rodent hairs and other extraneous matter.

2.11 Food additive means any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which to food for technological (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food results, or may be reasonably expected to result, (directly or indirectly) in it or its by-products becoming a component of or otherwise affecting the characteristics of such foods. The term does not include “contaminants” or substances added to food for maintaining or improving nutritional qualities.

2.12 Quarantine pest means a pest of potential economic importance to an area officially defined by importing country endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.

3. REQUIREMENTS

3.1 Pesticide residues

3.1.1 The residues of authorized pesticides found in agricultural commodities and food shall not exceed the Maximum Residue Limits (MRLs). In case of persistent pesticides that have been banned for agricultural use for a long period, yet the residues still exist in general environments, these residues remaining in the commodities and food shall not be greater than the Extraneous Maximum Residue Limits (EMRLs). The established MRLs and EMRLs are appeared in Table 1.1, as well as in Table 2.1.

3.1.2 As for the MRLs of the residues of any authorized pesticide that does not appear in neither Table 1, nor Table 2 of this standard, requirements shall refer to the MRLs elaborated by the Joint FAO/WHO Food Standards Programme (Codex), or those appropriately required by importing countries. However, the residues of the pesticides regulated as Type Four Hazardous Substance in accordance with the Notification of the Ministry of Industry regarding the list of hazardous substances issued in line with Hazardous Substance Act, B.E. 2535 (1992), shall not be found.

3.2 Residues of veterinary drugs

3.2.1 The residues of veterinary drugs which are authorized for use in food producing animal found in agricultural commodities and food must not exceed the Maximum Residue Limits (MRLs) established in Table 2.2 and Table 3.1.

3.2.2 As for MRLs of the residues of authorized veterinary drugs for use in food producing animal that do not appear in the Table of this standard, requirements shall refer to either the MRLs elaborated by Codex, or those appropriately required by importing countries. However, the residues of veterinary drugs indicated in Annex D shall not be found.

3.3 Contaminants

Contaminants existing in agricultural commodities and food shall not exceed the Maximum Levels (MLs) established in Table 1.2, Table 2.3 and Table 3.2.

3.4 Food additives

The MLs of food additives found in agricultural commodities and food shall comply with either provisions concerning contaminants of Codex, importing country, or the limits established in Table 1.3, and Table 3.3.

3.5 Microbiological criteria

Microbiological Criteria found in agricultural commodities and food shall comply with either the criteria indicated in Table 1.4, Table 2.4, and Table 3.4, or those appropriately required by importing countries which consist of:

- (1) “n” = Minimum number of sample units which shall be examined from a lot of food.
- (2) “m” = Acceptable microbiological level in sample unit.
- (3) “c” = The maximum allowable number of sample units in which microbiological level detected are greater than “m”.
- (4) “M” = The microbiological level specified, when exceeded in one or more samples would cause the lot to be rejected.
 - Where “M” is not indicated, both of “m” and “c” are taken into consideration as judging criteria
 - Where “M” is indicated, and the microbiological level found is greater than “m”, the total amount of the detected samples shall not be greater than “c”, and the microbiological level found shall not be higher than “M”.
 - Where appropriate, the number of sample units taken to be inspected may be reduced; however process control systems and histories of a producer shall be taken into consideration.

3.6 Production systems

3.6.1 Primary production of food obtained from plant, livestock and fish shall comply with relevant Good Agricultural Practices (GAPs) specified in certain Thai Agricultural Standards.

3.6.2 Production systems concerning handling, preparation and processing (after primary production) shall comply with General Principles of Food Hygiene and/or Hazard Analysis and Critical Control Point (HACCP) as appear in the Recommended International Code of Practice; General Principles of Food Hygiene (CAC/RCP 1-1969, Rev.4-2003) or Thai Agricultural

Standard on Code of Practice: General Principles of Food Hygiene (TAS 9023) and Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for Its Application (TAS 9024).

3.6.3 Low-acid and acidified low acid food packed in hermetically sealed containers considered as that do not require refrigeration shall obtain from the production systems defined in 3.6.1 and 3.6.2. Also, the canning and heat processing practices shall comply with the requirements addressed in the Recommended International Code of Hygienic Practice for Low and Acidified Low Acid Canned Foods (CAC/RCP 23-1979, Rev. 2-1993).

3.7 Pest

Any quarantine pest of importing countries shall not be detected in agricultural commodities which have a potential to be vectors. The commodities shall be obtained from appropriate management measures which are based on scientific justification according to bilateral agreement between the exporting and importing countries.

3.8 Epidemics

Together with the requirements of the importing countries, neither the diseases identified in Table 2.5 nor those indicated in Table 3.5 are found in livestock and fish.

3.9 Method of Analysis

3.9.1 Analytical methods for pesticides, veterinary drugs, contaminants, food additives and micro-organisms mentioned in 3.1-3.5 shall comply with Codex methods of analysis.

3.9.2 Where the methods identified in 3.9.1 are not available, other methods that meet performance characteristics are appropriate to specific analysis. The method should be one of the followings:

(1) Official method of analysis elaborated by national or international organizations regarding standardization, or the recommended method published that is internationally accepted;

(2) The method that has been validated by laboratories employing collaborative study according to internationally accepted guidelines;

(3) Where none of the methods mentioned in (1) and (2) are available, the method that has been validated according to internationally recognized protocol on single laboratory validation.

Table 1

Plants and their products

Table 1.1 Maximum Residue Limits for Pesticide

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1. Chilled or frozen fresh fruits and vegetables			
1.1 Banana	chlorpyrifos	chlorpyrifos (fat-soluble)	2
	carbofuran	sum of carbofuran, and 3-hydroxycarbofuran, expressed as carbofuran	0.1
	aldrin & dieldrin ^{1/2}	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ^{1/2}	sum of cis- and trans-chlordane (fat-soluble)	0.02
	DDT ^{1/2}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.01

^{1/2} Extraneous Maximum Residue Limits (EMRLs)

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.2 Rambutan	chlorpyrifos	chlorpyrifos (fat-soluble)	0.5
	carbaryl	carbaryl	1
	methidathion	methidathion	1
	aldrin & dieldrin ^{1L}	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordan ^{1L}	sum of cis- and trans- chlordan (fat-soluble)	0.02
	DDT ^{1L}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1L}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ^{1L}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.01

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.3 Durian	carbaryl	carbaryl	1
	cypermethrin	cypermethrin (sum of isomers) (fat-soluble)	0.5
	profenofos	profenofos	0.05
	methidathion	methidathion	1
	phosalone	phosalone (fat-soluble)	1
	lambda-cyhalothrin	cyhalothrin (sum of isomers)	0.5
	carbofuran	sum of carbofuran, and 3-hydroxycarbofuran, expressed as carbofuran	0.3
	carbosulfan	carbosulfan	0.2
	aldrin & dieldrin ^{1/2}	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ^{1/2}	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ^{1/2}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.01

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.4 Mango	carbaryl	carbaryl	1
	profenofos	profenofos	0.05
	fenvalerate	fenvalerate (fat-soluble)	1
	deltamethrin	sum of deltamethrin, alpha-R- and trans- deltamethrin (fat-soluble)	0.5
	lambda-cyhalothrin	cyhalothrin (sum of isomers)	0.5
	aldrin & dieldrin ^{1/2}	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ^{1/2}	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ^{1/2}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.01

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.5 Mangosteen	carbaryl	carbaryl	1
	profenofos	profenofos	0.05
	phosalone	phosalone (fat-soluble)	1
	aldrin & dieldrin ^{1/2}	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ^{1/2}	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ^{1/2}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.01

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.6 Longan	chlorpyrifos	chlorpyrifos (fat-soluble)	0.5
	carbaryl	carbaryl	1
	fenvalerate	fenvalerate (fat-soluble)	1
	lambda-cyhalothrin	cyhalothrin (sum of isomers)	0.5
	aldrin & dieldrin ¹²	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ¹²	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ¹²	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ¹²	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ¹²	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.01

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.7 Litchi	chlorpyrifos	chlorpyrifos (fat-soluble)	0.5
	carbaryl	carbaryl	1
	fenvalerate	fenvalerate (fat-soluble)	1
	lambda-cyhalothrin	cyhalothrin (sum of isomers)	0.5
	aldrin & dieldrin ¹²	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ¹²	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ¹²	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ¹²	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ¹²	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.01

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.8 Citrus fruits	cypermethrin	cypermethrin (sum of isomers) (fat-soluble)	2
	dimethoate	dimethoate	2
	profenofos	profenofos	0.1
	malathion	malathion	4
	methomyl	Sum of methomyl and thiodicarb expressed as methomyl	1
	dichlorvos	dichlorvos	0.2
	methidathion	methidathion	2
	phosalone	phosalone (fat-soluble)	1
	carbosulfan	carbosulfan	0.1
	aldrin & dieldrin ^{1/2}	sum of HHDN and HEOD (fat-soluble)	0.05
	Chlordane ^{1/2}	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ^{1/2}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.01	

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.9 Okra	chlorpyrifos	chlorpyrifos	0.5
	cypermethrin	cypermethrin (sum of isomers) (fat-soluble)	0.2
	carbofuran	sum of carbofuran, and 3-hydroxycarbofuran, expressed as carbofuran	0.5
	aldrin & dieldrin ^{1/2}	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ^{1/2}	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ^{1/2}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.03

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.10 Sweet corn (corn-on-the-cob)	carbaryl	carbaryl	0.1
	cypermethrin	cypermethrin (sum of isomers) (fat-soluble)	0.05
	malathion	malathion	0.02
	diazinon	diazinon (fat-soluble)	0.02
	fenitrothion	fenitrothion	1
	fenvalerate	fenvalerate (fat-soluble)	0.1
	pirimipos-methyl	pirimipos-methyl (fat-soluble)	1
	deltamethrin	sum of deltamethrin, alpha-R-and trans- deltamethrin (fat- soluble)	0.05
	carbofuran	sum of carbofuran, 3- hydroxycarbofuran and conjugated 3- hydroxycarbofuran, expressed as carbofuran	0.1
	carbosulfan	carbosulfan	1
	aldrin & dieldrin ^{1/2}	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ^{1/2}	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ^{1/2}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.05	

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
1.11 Baby corn	carbaryl	carbaryl	0.1
	cypermethrin	cypermethrin (sum of isomers) (fat-soluble)	0.05
	malathion	malathion	0.02
	diazinon	diazinon (fat-soluble)	0.02
	fenitrothion	fenitrothion	1
	fenvalerate	fenvalerate (fat-soluble)	0.1
	pirimipos-methyl	pirimipos-methyl (fat-soluble)	1
	deltamethrin	sum of deltamethrin, alpha-R- and trans- deltamethrin (fat-soluble)	0.05
	carbofuran	sum of carbofuran, and 3-hydroxycarbofuran expressed as carbofuran	0.1
	carbosulfan	carbosulfan	1
	aldrin & dieldrin ^{1/2}	sum of HHDN and HEOD (fat-soluble)	0.05
	chlordane ^{1/2}	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ^{1/2}	sum of p, p'-DDT, o,p'- DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.01
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.05	

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL ; mg/kg)
2. Cereals			
2.1 Rice	chlorpyrifos	chlorpyrifos (fat-soluble)	0.1
	carbaryl	carbaryl	1
	fenitrothion	fenitrothion	0.2
	carbofuran	sum of carbofuran, and 3-hydroxycarbofuran expressed as carbofuran	0.1
	carbosulfan	carbosulfan	0.2
	chlordane ^{1L}	sum of cis- and trans- chlordane (fat-soluble)	0.02
	DDT ^{1L}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.1
	endrin ^{1L}	sum of endrin and delta-keto-endrin (fat-soluble)	0.01
	heptachlor ^{1L}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.02

Table 1.2 Maximum Levels for Contaminants

Commodities	Contaminants	Maximum Level (ML; mg/kg)
1. Processed vegetables and fruits in hermetically sealed container		
1.1 Vegetables	tin	250
1.2 Brassica vegetables, Bulb vegetables, and Fruiting vegetables	cadmium	0.05
1.3 Leafy vegetables	cadmium	0.2
1.4 Other vegetables excluding 1.2 and 1.3	cadmium	0.1
1.5 Brassica vegetables and leafy vegetables	lead	0.3
1.6 Bulb vegetables, Fruiting vegetables, and Roots and tuber vegetables	lead	0.1
1.7 Legume vegetables	lead	0.2
1.8 Fruits	tin	250
1.9 Berries and other small fruits	lead	0.2
1.10 Other fruits excluding 1.9	lead	0.1
1.11 Fruit juice in hermetically sealed container	lead	0.05
	tin	200
1.12 Apple juice in hermetically sealed container	lead	0.05
	tin	200
	patulin	50 µg/kg

Table 1.3 Maximum Levels for Food Additives

Commodities	Food additives	Maximum Level (ML; mg/kg)
Longan	sulphur dioxide	50 (in flesh)

Table 1.4 Microbiological Criteria

Commodities	microorganism	n	c	m	M
1. Pre-cut ready-to-eat fresh fruits and vegetables	<i>E. coli</i>	5	2	100 cfu/g	1,000 cfu/g
	<i>Salmonella</i> spp.	5	0	Not detect in 25 g	-
2. Pickled ginger	<i>E. coli</i>	5	0	< 3 MPN/g	-
	<i>Salmonella</i> spp.	5	0	Not detect in 25 g	-
3. Low-acid fruits and vegetables in hermetically sealed containers	incubation test $35 \pm 2.8^{\circ}\text{C}/10-14$ days	8	0	container and product remain their normal appearance and characteristics	-
	mesophilic flat sour	8	0	Not detect in 2 g	-
	thermophilic flat sour	8	0	Not detect in 2 g	-
	thermophilic anaerobe	8	0	Not detect in 2 g	-
	putrefactive anaerobe	8	0	Not detect in 2 g	-
4. Acidified low-acid fruits and vegetables in hermetically sealed containers	incubation test $35 \pm 2.8^{\circ}\text{C}/10-14$ days	8	0	container and product remain their normal appearance and characteristics	-
	mesophilic flat sour	8	0	Not detect in 2 g	-
	thermophilic flat sour	8	0	Not detect in 2 g	-
	yeast and mold	8	0	Not detect in 2 g	-

Table 2

Livestock and their products

Table 2.1 Maximum Residue Limits for Pesticide

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL;mg/kg)
1.Chilled/ frozen fresh meat			
1.1 Poultry	acephate	acephate	0.01
	chlorpyrifos	chlorpyrifos (fat-soluble)	0.01 (fat) ^{1/2}
	cypermethrin	cypermethrin (sum of isomers) (fat-soluble)	0.05
	dicofol	sum of (2,2-dichloro-1,1-bis (4-chlorophenyl) ethanol (p,p' - FW 152) expressed as dicofol (fat-soluble)	0.1 (fat) ^{1/2}
	dimethoate	dimethoate	0.05
	methomyl	sum of methomyl and thiodicarb expressed as methomyl	0.02
	deltamethrin	sum of deltamethrin, alpha-R- and trans-deltamethrin (fat-soluble)	0.1 (fat) ^{1/2}
	permethrin	permethrin (sum of isomers) (fat-soluble)	0.1
	aldrin&dieldrin ^{2/2}	sum of HHDN and HEOD (fat-soluble)	0.2 (fat) ^{1/2}
	chlordane ^{2/2}	sum of cis- and trans-chlordane (fat-soluble)	0.05 (fat) ^{1/2}

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL; mg/kg)
1.1 Poultry (cont.)	DDT ^{1/2}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	0.3 (fat) ^{1/2}
	endrin ^{1/2}	sum of endrin and delta-keto-endrin (fat-soluble)	0.1 (fat) ^{1/2}
	heptachlor ^{1/2}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.2 (fat) ^{1/2}
	alpha-hexachlorocyclohexane ; α -BHC	alpha-hexachlorocyclohexane ; α -BHC	0.2 (fat) ^{1/2}
	beta-hexachlorocyclohexane ; β -BHC	beta-hexachlorocyclohexane ; β -BHC	0.1 (fat) ^{1/2}
	lindane	lindane	0.05 (fat) ^{1/2}
	hexachlorobenzene ; HCB	hexachlorobenzene	0.2 (fat) ^{1/2}
1.2 Pig	acephate	acephate	0.02
	carbaryl	carbaryl	0.05
	chlorpyrifos	chlorpyrifos	0.02 (fat) ^{1/2}
	cypermethrin	cypermethrin	0.2 (fat) ^{1/2}
	dicofol	sum of (2,2-dichloro-1,1-bis(4-chlorophenyl) ethanol (p,p' - FW 152) expressed as dicofol (fat-soluble)	0.05
	dimethoate	dimethoate	0.05
	methomyl	sum of methomyl and thiodicarb expressed as methomyl	0.02
	profenofos	profenofos	0.05
	permethrin	permethrin (sum of isomers) (fat-soluble)	1.0 (fat) ^{1/2}
	deltamethrin	sum of deltamethrin, alpha-R- and trans-deltamethrin (fat-soluble)	0.5 (fat) ^{1/2}

^{1/2} Maximum Residue Limits (MRLs) of pesticides found in fat part dispersing in meat muscle

^{2/2} Extraneous Maximum Residue Limits (EMRLs) for Aldrin & Dieldrin, Chlordane, DDT, Endrin, and Heptachlor

Commodities	Pesticide residues	Definition of residue	Maximum Residue Level (MRL;mg/kg)
1.2 Pig (cont)	aldrin&dielrin ^{2/}	sum of HHDN and HEOD (fat-soluble)	0.2 (fat) ^{1/}
	chlordan ^{2/} (sum of cis, trans and oxychlordan)	sum of cis- and trans-chlordan (fat-soluble)	0.05 (fat) ^{1/}
	DDT ^{1/}	sum of p, p'-DDT, o,p'-DDT, p,p'-DDE and {p,p'-TDE (DDD)} (fat-soluble)	5.0 (fat) ^{1/}
	endrin ^{1/}	sum of endrin and delta-keto-endrin (fat-soluble)	0.05 (fat) ^{1/}
	heptachlor ^{1/}	sum of heptachlor and heptachlor epoxide (fat-soluble)	0.2 (fat) ^{1/}
	alpha-hexachlorocyclohexane ; α -BHC	alpha-hexachlorocyclohexane ; α -BHC	0.2 (fat) ^{1/}
	beta- hexachlorocyclohexane ; β -BHC	beta- hexachlorocyclohexane ; β -BHC	0.1 (fat) ^{1/}
	lindane	lindane	0.02 (fat) ^{1/}
	hexachlorobenzene ; HCB	hexachlorobenzene	0.2 (fat) ^{1/}
2. Heat-treated meat			
2.1 Poultry			comply with the pesticide residue requirements indicated in 1.1 (Chilled/frozen poultry meat)
2.2 Pig			comply with the pesticide residue requirements indicated in 1.2 (Chilled/frozen pork)

Table 2.1 Maximum Residue Limits for Veterinary Drugs

Commodities	Residue veterinary drugs	Definition of residue	Maximum Residue Level (MRL;mg/kg)
1.Chilled/ frozen meat			
1.1 Poultry	procaine benzylpenicillin	penzylpenicillin	50
	chlortetracycline/oxytetracycline/ tetracycline	chlortetracycline, or oxytetracycline, or tetracycline, singly or in combination	200
	spiramycin	sum of spiramycin and neospiramycin	200
	lincomycin	lincomycin	200
	spectinomycin	spectinomycin	500
	nicarbazin	N,N'-bis (4-nitropheyl) urea	200
	levamisole	levamisole	10
	albendazole	2-amionsulfone metabolite	100
	flubendazole	flubendazole	200
	diclazuril	diclazuril	500
	neomycin	neomycin	500
	dihydrostreptomycin/Streptomycin	sum of dihydrostreptomycin and streptomycin	600

Commodities	Residue veterinary drugs	Definition of residue	Maximum Residue Level (MRL;mg/kg)
1.2 Pig	benzylpenicillin/procaine benzylpenicillin	benzylpenicillin	50
	neomycin	neomycin	500
	dihydrostreptomycin/Streptomycin	sum of dihydrostreptomycin and streptomycin	600
	gentamicin	gentamicin	100
	chlortetracycline/oxytetracycline/ tetracycline	chlortetracycline, or oxytetracycline, or tetracycline, or sum of all 3 together	200
	ceftiofur	desfuroylceftiofur	1,000
	lincomycin	lincomycin	200
	spectinomycin	spectinomycin	500
	doramectin	doramectin	5
	spiramycin	spiramycin equivalent	200
	flubendazole	flubendazole	10
	thiabendazole	sum of thiabendazole and 5-hydroxythiabendazole	100
	levamisole	levamisole	10
	azaperone	sum of azaperone and azaperol	60
carazolol	carazolol	5	

Commodities	Residue veterinary drugs	Definition of residue	Maximum Residue Level (MRL; $\mu\text{g}/\text{kg}$)
2. Heat-treated meat			
2.1 Poultry			the residues of veterinary drugs found in raw meat shall comply with the veterinary drug residue requirements indicated in 1.1 (Chilled/frozen poultry meat)
2.2 Pig			the residues of veterinary drugs found in raw meat shall comply with the veterinary drug residue requirements indicated in 1.2 (Chilled/frozen pork)

Table 2.3 Maximum, Levels for Contaminants

Commodities	Contaminants	Maximum Level (ML;mg/kg)
1. Chilled/ frozen meat		
1.1 Poultry	polychlorinated biphenyls (PCBs)	4.00 pg/g (fat)
- meat	lead	0.1
- edible offal		0.5
- meat	cadmium	0.05
- liver		0.5
- kidney		1.0
- meat	total arsenic	0.5
- offal		1.0
1.2 Pig	polychlorinated biphenyls (PCBs)	1.50 pg/g (fat)
- meat	lead	0.1
- offal		0.5
- meat	cadmium	0.05
- liver		0.5
- kidney		1.0
- meat	total arsenic	0.5
- edible offal		1.0
2. Heat-treated meat		
2.1 Poultry		comply with the contaminant requirements indicated in 1.1 (Chilled/frozen poultry meat)
2.2 Pig		comply with the contaminant requirements indicated in 1.2 (Chilled/frozen pork meat)

Table 2.4 Microbiological Criteria

Commodities	Microorganism	n	c	m	M
1. Chilled/ frozen poultry meat	total count	5	2	5x10 ⁵ cfu/g	5x10 ⁶ cfu/g
	<i>Staphylococcus aureus</i>	5	0	100 cfu/g	-
	<i>Salmonella</i> spp. <i>S.typhimurium</i> , <i>S.enteritidis</i>	5	0	Not detect in 25 g	-
2. Chilled/ frozen pork	total count	5	2	5x10 ⁵ cfu/g	5x10 ⁶ cfu/g
	<i>Staphylococcus aureus</i>	5	0	100 cfu/g	-
	<i>Salmonella</i> spp. <i>S.typhimurium</i> , <i>S.enteritidis</i>	5	0	Not detect in 25 g	-
3. Heat-treated poultry meat	total count (cfu/g at 35-37°C)	5	2	1x10 ⁵ cfu/g	1x10 ⁶ cfu/g
	<i>E. coli</i>	5	0	Not detect in 0.1 g	-
	<i>Staphylococcus aureus</i>	5	0	Not detect in 1 g	-
	<i>Salmonella</i> spp.	5	0	Not detect in 25 g	-
	<i>Listeria monocytogenes</i>	5	0	Not detect in 25 g	-
	yeast and mold	5	0	≤1x10 ² cfu/g	-

Commodities	Microorganism	n	c	m	M
4.3 Heat-treated pork	total count (cfu/g at 35-37°C)	5	2	1x10 ⁵ cfu/g	1x10 ⁶ cfu/g
	<i>E. coli</i>	5	0	Not detect in 0.1 g	-
	<i>Staphylococcus aureus</i>	5	0	Not detect in 0.1 g	-
	<i>Salmonella</i> spp.	5	0	Not detect in 25 g	-
	<i>Listeria monocytogenes</i>	5	0	Not detect in 25 g	-
	yeast and mold	5	0	≤1x10 ² cfu/g	-

Table 2.5 Requirements for Epidemics

Species	Epidemics	Inspection
1. Chicken	<ul style="list-style-type: none"> - avian influenza - gumboro - Newcastle disease 	<p>Shall be free from any animal disease shown in the documents:</p> <ul style="list-style-type: none"> - Animal health report at the farm level - Animal health report (pre-mortem) - Animal health report (post-mortem) <p>Health certificate is required for imported chicken</p>
2. Duck	<ul style="list-style-type: none"> - duck plaque - Newcastle disease - avian influenza 	<p>Shall be free from any animal disease shown in the documents:</p> <ul style="list-style-type: none"> - Animal health report at the farm level - Animal health report (post-mortem) - Animal health report (post-mortem) <p>Health certificate is required for imported duck</p>
3. Pig	<ul style="list-style-type: none"> - swine fever - foot and mouth disease 	<p>Shall be free from any animal disease shown in the following documents:</p> <ul style="list-style-type: none"> - Animal health report at the farm level - Animal health report at abattoir (post-mortem) - Animal health report at abattoir (post-mortem) <p>Health certificate is required for imported pig</p>

Table 3**Fish and their products****Table 3.1 Maximum Residue Limit for Veterinary Drugs**

Commodities	Residue veterinary drugs	Definition of residue	Maximum Residue Level (MRL; µg/kg)
1. Chilled/ frozen shrimps or prawns	oxytetracycline	oxytetracycline	200

Table 3.2 Maximum Levels for Contaminants

Commodities	Contaminants	Maximum Level (ML; mg/kg)
1. Chilled/ frozen shrimps or prawns	cadmium	0.5
	total mercury	0.5
	lead	0.5
2. Shrimps and prawns in hermetically sealed containers	cadmium	0.5
	total mercury	0.5
	lead	0.5
3. Tuna in hermetically sealed containers	cadmium	0.1
	total mercury	1.0
	lead	0.4
	histamine	10 mg/100 g

Table 3.3 Maximum Levels for Food additives

Commodities	Contaminants	Maximum Level (ML; mg/kg)
1. Chilled/ frozen shrimps and prawns	phosphates	5,000 (as P ₂ O ₅)
	sulphites	100 (edible part of fresh shrimps or prawns) (expressed as SO ₂) 30 (edible part of cooked shrimps or prawns) (expressed as SO ₂)
2. Shrimps and prawns in hermetically sealed containers	sulphites	30 (expressed as SO ₂)
	EDTAs ; Ethylenediaminetetra acetate	100

Table 3.4 Microbiological Criteria

Commodities	Microorganism	n	c	m	M
1. Chilled/ frozen shrimps or prawns	total viable count	5	2	5.0x10 ⁵ cfu/g	5.0x10 ⁶ cfu/g
	<i>E. coli</i>	5	0	<3 MPN/g	-
	<i>Staphylococcus aureus</i>	5	2	100 MPN/g	1,000 MPN/g
	<i>Salmonella</i> spp.	5	0	Not detect in 25 g	-
	<i>Vibrio cholerae</i>	5	0	Not detect in 25 g	-

Commodities	Microorganism	n	c	m	M
2. Chilled/ Frozen ready-to-eat boiled shrimps or prawns	total viable count	5	2	5.0×10^4 cfu/g	5.0×10^5 cfu/g
	<i>E. coli</i>	5	0	<3 MPN/g	-
	<i>Staphylococcus aureus</i>	5	1	100 MPN/g	1000 MPN/g
	<i>Salmonella</i> spp.	5	0	Not detect in 25 g	-
	<i>Vibrio cholerae</i>	5	0	Not detect in 25 g	-
	<i>Vibrio parahaemolyticus</i>	5	2	10 MPN/g	100 MPN/g
	<i>Listeria monocytogenes</i>	5	0	Not detect in 25 g	-
3. Chilled/ Frozen ready-to-cook heated shrimps and prawns	total viable count	5	2	1.0×10^5 cfu/g	1.0×10^6 cfu/g
	<i>E. coli</i>	5	0	<3 MPN/g	-
	<i>Staphylococcus aureus</i>	5	2	100 MPN/g	1000 MPN/g
	<i>Salmonella</i> spp.	5	0	Not detect in 25 g	-
	<i>Vibrio cholerae</i>	5	0	Not detect in 25 g	-
4. shrimps or prawns in hermetically sealed container	incubation test $35 \pm 2.8^\circ\text{C}/10-14$ days	8	0	Container and product remain their normal characteristics	-
	<i>Clostridium botulinum</i>	8	0	Not detect in 1 g	-
	mesophilic flat sour	8	0	Not detect in 1 g	-

Commodities	Microorganism	n	c	m	M
4. shrimps or prawns in hermetically sealed container (cont.)	thermophilic flat sour	8	0	Not detect in 1 g	-
5. Tuna in hermitically sealed containers	incubation test 35 ±2.8 ⁰ C/10-14 days	8	0	Container and product remain their normal characteristics	-
	<i>Clostridium botulinum</i>	8	0	Not detect in 1 g	-
	mesophilic flat sour	8	0	Not detect in 1 g	-
	thermophilic flat sour	8	0	Not detect in 1 g	-

Table 3.5 Requirements for Epidemics

Species	Epidemics	Inspection
Live Shrimps or prawns and chilled/frozen shrimps or prawns	<ul style="list-style-type: none"> - White spot disease - Taura syndrome - Yellow head disease - Infectious Hydrodermal - Haematopietic Necrosis Virus disease (IHHNV) 	Health certificate

Annex A**Abbreviation**

Abbreviations used in this standard are as follows:

cfu/g	colony forming unit per gram
LOQ	limit of quantitation
ML	maximum level
MPN/g	most probable number per gram
MRL	maximum residue limit
MRPL	minimum required performance limit
ND	not detected

Annex B

Unit System

The unit and symbol used in this standard and the unit of SI (International System of Units or *Le Système International d'Unités*) recognized to be used are as follows:

Measurement	Unit	Symbol
mass	gram	g
	milligram	mg
concentration	milligram per gram	mg/g
	milligram per kilogram	mg/kg
	microgram per kilogram	µg/kg
	pictogram per gram	pg/g
temperature	degree Celsius	°C

Annex C

The pesticides regulated as Type Four Hazardous Substance in accordance with the Notification of the Ministry of Industry regarding the list of hazardous substances issued in line with Hazardous Substance Act B.E. 2535 (1992)

2,4,5 -T	demephion	methamidophos
2,4,5-TP	demeton	mevinphos
aldrin	dieldrin	MGK repellent-11
aminocarb	dimefox	mirex
amitrole	dinoseb	monocrotophos
aramite	dinoterb	nitrofen
azinphos ethyl	disulfoton	o-dichlorobenzene
azinphos methyl	DNOC	parathion ethyl
beta-HCH (1,3,5/2,4,6-hexachloro-cyclohexane)	EDB	parathion-methyl
BHC	endosulfan (except CS formulation)	paris green
binapacryl	endrin	pentachlorophenate sodium
bromophos	ethyl hexyleneglycol (ethyl hexane diol)	pentachlorophenol
bromophos ethyl	ethylene dichloride	phenothiol
cadmium and cadmium compounds	ethylene oxide (1,2-epoxyethane)	phorate
calcium arsenate	fensulfothion	phosphamidon
captafol	fentin	prothoate
carbon tetrachloride	fluoroacetamide	pyrinuron (piriminel)
chlordane	fonofos	safrole
chlordecone	heptachlor	scharidan
chlordimeform	hexachlorobenzene	sodium arsenite
chlorobenzilate	lead arsenate	sodium chlorate
chlorophenols	leptophos	sodium fluoroacetate
chlorthiophos	lindane (>99% gamma-HCH or gamma-BHC)	strobane (polychloroterpenes)
copper arsenate hydroxide	MCPB	sulfotep
cycloheximide	mecoprop	TDE or DDD [1,1-dichloro-2,2-bis(4-chlorophenyl)ethane]
cyhexatin	mephosfolan	TEPP
daminozide	mercury compounds	thallium sulfate
DBCP		toxaphene
DDT		

Annex D

Prohibited veterinary drugs

D.1 Prohibited veterinary drugs in aquatic fishery and fishery products

Chloramphenicol

MRPL 0.3 µg/kg

Nitrofurans group

metabolite as follows:

- 3-amino-2-oxazolidinone; AOZ
- 5-methylmorpholino-3-amino-2-oxazolidinone; AMOZ
- Aminohydantoin; AHD
- Semicarbazide; SEM

} MRPL of AOZ and AMOZ = 0.3 µg/kg

} MRPL of AHD and SEM = 1.0 µg/kg

nitroimidazole group

salbutamol

clenbuterol

carbadox

D.2 Prohibited veterinary drugs in aquatic fishery and fishery products

Chloramphenicol

MRPL 0.3 µg/kg

Nitrofurans group

metabolite 4 as follows:

- 3-amino-2-oxazolidinone; AOZ
- 5-methylmorpholino-3-amino-2-oxazolidinone; AMOZ
- aminohydantoin; AHD
- semicarbazide; SEM

} MRPL of AOZ and AMOZ = 0.3 µg/kg

} MRPL of AHD and SEM = 1.0 µg/kg

oxolinic acid

LOQ = 0.02 mg/kg