Tentative Translation

JAS 1419

JAPANESE AGRICULTURAL STANDARD

Processed tomato products

Date of Establishment: 1979-10-11
Date of Revision: 2024-8-15

Ministry of Agriculture, Forestry and Fisheries

Precautions for using English version of JAS

This English translation has been made by the drafting party etc., based on the original text (Japanese version), and has been posted on the website of the Food and Agricultural Materials Inspection Center (FAMIC), Incorporated Administrative Agency, with permission of the publisher of the original text (Ministry of Agriculture, Forestry and Fisheries).

The translation is made in consideration of technical contents, but it is aimed to provide information when using JAS original text, and is not recognized as having the same effects as the original text.

If there is any doubt in the translation, please follow the original.

FAMIC is not responsible for inconvenience by using only the translation.

Food and Agricultural Materials Inspection Center, Incorporated Administrative Agency

Contents

Page

Foreword

This Japanese Agricultural Standard has been revised by the Minister of Agriculture, Forestry and Fisheries through deliberations at the Council for the Japanese Agricultural Standards as the result of proposal for revision of Japanese Agricultural Standard submitted by Japan Tomato Processors Association with the original bill being attached, based on the provision of Article 4, paragraph (1) of the Act on Japanese Agricultural Standards as applied mutatis mutandis pursuant to the provision of Article 5 of the Act. This edition replaces the previous edition (JAS 1419:2019), which has been technically revised.

Attention is drawn to the possibility that some parts of this standard may conflict with patent rights, published patent application or utility model rights. The Minister of Agriculture, Forestry and Fisheries and the Council for the Japanese Agricultural Standards are not responsible for identifying any of such patent rights, published patent application or utility model rights.

JAPANESE AGRICULTURAL STANDARD JAS
(Tentative Translation) 1419 : 20xx

Processed tomato products

1 Scope

This document specifies the quality of tomato juice, tomato mixed juice, tomato puree, tomato paste, tomato ketchup, tomato sauce, chili sauce and solid tomato.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. The latest edition of the referenced document (including any amendments) applies.

CODEX STAN 192, *General Standard for Food Additives*

JIS K 0557, *Water used for industrial water and wastewater analysis*

JIS P 3801, *Filter paper (for chemical analysis)*

JIS R 3505, *Volumetric glassware*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
tomato
fully-ripened red or reddish fruit of tomatoes (*Lycopersicum esculentum* P. Mill)

3.2
tomato concentrate
product (excluding products in powder form or solid form), with at least 8% of soluble solids excluding salt, prepared by crushing and extracting the juice from or straining, tomatoes, and, after removing peels, seeds, etc., concentrating them

3.3
tomato juice
following product:

a) product prepared by crushing and extracting the juice from, or straining, tomatoes, and removing peels, seeds, etc.; or product prepared by further adding salt;

b) product which is reconstituted as extracted juice by diluting tomato concentrate; or product prepared by further adding salt

3.4
tomato mixed juice
following product :

a) product made of tomato juice as the main ingredients, prepared by adding liquid obtained by crushing and extracting juice from celery, carrots, or other vegetables, or liquid obtained by diluting the concentrate of the extracted juice to reconstitute it as the extracted juice, to tomato juice;

b) product made of tomato juice as the main ingredients, prepared by adding the following products to

a): salt, spices, sorts of sugar, acidity regulators (including fruit juice of citrus fruits), seasoning (amino acid etc.) etc. [excluding agricultural, livestock and marine products other than vegetables (including mushrooms and wild vegetables; the same applies hereinafter) and coloring agents]

3.5
tomato puree
following product :

a) tomato concentrate, with less than 24 % of the soluble solids excluding salt;

b) product, with less than 24% of soluble solids excluding salt, prepared by adding a small amount of the following products to a), to the extent which does not alter the flavor and taste which is peculiar to tomatoes: salt, spices, onions or other vegetables, lemons or pH control agents

3.6
tomato paste
following product :

a) tomato concentrate, with at least 24% of soluble solids excluding salt;

b) product, with at least 24% of soluble solids excluding salt, prepared by adding a small amount of the following products to a), to the extent which does not alter the flavor and taste which is peculiar to tomatoes: salt, spices, onions or other vegetables, lemons or pH control agents

3.7
tomato ketchup
following product :

a) product, with at least 25% of soluble solids, prepared by seasoning tomato concentrate with salt, spices, vinegar, sorts of sugar and onions or garlic;

b) product with at least 25% of soluble solids , prepared by adding the following products to a): acidity regulators (including fruit juice of citrus fruits), seasoning (amino acid etc.), thickening agents, etc. (excluding agricultural, livestock and marine products other than onions and garlic and coloring agents)

3.8
tomato sauce
following product :

a) product, with 8% or more, but less than 25% of soluble solids, prepared by adding peeled and chopped tomatoes to tomato concentrate or not, and seasoning with salt and spices;

b) product, with 8% or more, but less than 25% of soluble solids, prepared by adding the following products to a): vinegar, sorts of sugar, edible oils and fats, liquor, onions, garlic, mushrooms, or other vegetables, acidity regulators (including fruit juice of citrus fruits), seasoning (amino acid etc.), thickening agents etc. (excluding agricultural, livestock and marines products other than vegetables)

3.9
chili sauce
following product:

a) product, with at least 25% of soluble solids, prepared by chopping or roughly crushing tomatoes; removing the peels thereof while most of the seeds remained; concentrating them (excluding those in solid form); and seasoning with salt, spices, vinegar and sorts of sugar ;

b) product, with at least 25% of soluble solids, prepared by adding the following products to a): onions, garlic, sweet peppers, celery, or other vegetables, acidity regulators (including fruit juice of citrus fruits), seasoning (amino acid etc.), calcium salt, etc. (excluding agricultural, livestock or marine products other than vegetables and coloring agents)

3.10
whole
peeled or unpeeled tomato in the initial or nearly initial shape, prepared by removing the top core and the hard part of the core of fruit

3.11
diced
product in cubic form, prepared by cutting the whole in the nearly uniform sizes

3.12
packing medium
following product:

a) tomato juice, tomato puree, or tomato paste with or without chopped vegetables (including extracted juice of vegetables) such as celery, sweet pepper, onions;

b) product prepared by adding the following products to a): salt, sorts of sugar, spices, etc. (excluding agricultural, livestock and marine products other than vegetables and coloring agents)

3.13
solid tomato
product prepared by adding or not adding packing medium to tomatoes in the shapes such as the whole or the diced and heat sterilizing them

3.14
irregular-shaped
product prepared by crushing the whole irregularly

3.15
content percentage of vegetables other than tomato
proportion of the weight of vegetables other than tomatoes used as ingredients in the weight of product

4 Quality

4.1 Tomato juice

The quality of Tomato juice shall conform to the quality criteria for each classification of Table 1.

Table 1 — Quality criteria for each classification of Tomato juice

Category	Criteria
Property	Being as follows: **a)** The flavor and the taste, and the color and the luster is good, and there is no an objectionable taste or odor; **b)** The grains are minute, and are distributed uniformly, and the consistency is moderate; **c)** There are few impurities.
Soluble solids excluding salt	4,5 % or more when tested by the method specified in 5.2 and 5.3
Ingredients	Not using ingredients other than those listed below: **a)** tomato (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method); **b)** tomato concentrate (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method, in case of the soluble solids excluding salt content of the tomato concentrate being adjusted to 4,5 %); **c)** salt.
Additives	Not being used
Net contents	Conform to the declared weight

4.2 Tomato mixed juice

The quality of Tomato mixed juice shall conform to the quality criteria for each classification of Table 2.

Table 2 — Quality criteria for each classification of Tomato mixed juice

Category	Criteria
Property	Same as the criteria for the property in Table 1
Soluble solids excluding salt	4,5 % or more, when tested by the method specified in 5.2 and 5.3
Percentage of extracted juice of vegetables other than tomato	10 % or more
Ingredients	Not using ingredients other than those listed below: **a)** tomato juice [the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the absorpriometric method. (When diluting the tomato concentrate and turn it to tomato juice, t the lycopene content of which is 7 × 10 mg/kg or more at the 4,5 % of soluble solids excluding salt)]; **b)** extracted juice of celery, carrot, or other vegetables, or concentrate of those extracted juice; **c)** salt; **d)** spices; **e)** sorts of sugar; **f)** lemon juice.
Additives	Being as follows: **a)** They conform to the provisions of 3.2 of CODEX STAN 192, and the conditions of use conform to the provisions of 3.3 of the document; **b)** The amounts of use are accurately recorded and the record shall be kept; **c)** Information that the additives conform to the provision of a) is provided to general consumers by one of the following methods; provided, however, that this does not apply to the cases where additives are added to products for business use: **1)** methods of making it available for public inspection via the internet; **2)** methods of displaying it on brochures, leaflets and any other publications where it is easily seen by general consumers; **3)** methods of displaying it at a place where it is easily seen by general consumers in stores; **4)** methods of providing it to general consumers at their request, while clearly indicating the contact address on the products.
Net contents	Same as the criteria for the net contents in Table 1

4.3 Tomato puree and tomato paste

The quality of Tomato puree and tomato paste shall conform to the quality criteria for each classification of Table 3.

Table 3 — Quality criteria for each classification of Tomato puree and tomato paste

Category	Criteria
Property	Same as the criteria for the property in Table 1
Soluble solids excluding salt	8 % or more, but less than 24 % on tomato puree and 24 % or more on tomato paste, when tested by the method specified in 5.2 and 5.3
Ingredients	Not using ingredients other than those listed below: **a)** tomato [the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method. (When using the tomato concentrate for the production, the lycopene content of the tomato concentrate is 7 × 10 mg/kg or more in the case of the soluble solids excluding salt of the tomato concentrate being adjusted to 4,5 %)]; **b)** salt.
Additives	Not using additives on tomato puree. For tomato paste, same as the criteria for the additives in Table 2
Net contents	Same as the criteria for the net contents in Table 1
Conditions of a container	Being as follows: **a)** sealed completely, and the appearance being good; **b)** a moderate degree of vacuum being maintained on the canned product and bottled product; **c)** a can with internal coating being used for the canned product.

4.4 Tomato ketchup

The quality of Tomato ketchup shall conform to the quality criteria for each classification of Table 4.

Table 4 — Quality criteria for each classification of Tomato ketchup

Category	Criteria	
	Special grade	**Normal grade**
Property	Being as follows: **a)** The flavor and the taste, and the color and the luster is good, and there is no an objectionable taste or odor; **b)** The grains are minute, and are distributed uniformly, and the consistency is moderate; **c)** There are few impurities.	Same as the criteria for the property in Table 1
Soluble solids	30 % or more, when tested by the method specified in 5.3	25 % or more, when tested by the method specified in 5.3
Percentage of extracted juice of vegetables other than tomato	1 % or more, but less than 5 %	
Ingredients	Not using ingredients other than those listed below: **a)** tomato concentrate (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method, in case of the soluble solids excluding salt of the tomato concentrate being adjusted to 4,5 %); **b)** onions; **c)** garlic; **d)** salt: **e)** spices; **f)** brewed vinegar; **g)** sorts of sugar.	
Additives	Same as the criteria for the additives in Table 2	
Net contents	Same as the criteria for the net contents in Table 1	
Conditions of a container	Same as the criteria for the conditions of a container in Table 3	

4.5 Tomato sauce

The quality of Tomato sauce shall conform to the quality criteria for each classification of Table 5.

Table 5 — Quality criteria for each classification of Tomato sauce

Category	Criteria
Property	Being as follows: **a)** The flavor and the taste, and the color and the luster is good, and there is no an objectionable taste or odor; **b)** On those do not contain small pieces of tomato pulp and vegetables, the grains are minute, on the whole, and are distributed uniformly, and the consistency is moderate; **c)** On those contain small pieces of tomato pulp and vegetables, the tissue of tomato pulp and vegetables other than tomato are soft, and are distributed uniformly, and the consistency is moderate; **d)** There are few impurities.
Soluble solids	8 % or more, but less than 25 %, when tested by the method specified in 5.3
Content percentage of vegetables other than tomato	Less than 25 %
Ingredients	Not using ingredients other than those listed below: **a)** tomato concentrate (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method, in case of the soluble solids excluding salt of the tomato concentrate being adjusted to 4,5 %); **b)** tomato (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method); **c)** onion, garlic, mushroom, or other vegetables; **d)** salt; **e)** spices; **f)** brewed vinegar; **g)** sorts of sugar; **h)** edible vegetable oils and fats; **i)** fruit wines.
Additives	Same as the criteria for the additives in Table 2
Net contents	Same as the criteria for the net contents in Table 1
Conditions of a container	Same as the criteria for the conditions of a container in Table 3

4.6 Chili sauce

The quality of Chili sauce shall conform to the quality criteria for each classification of Table 6.

Table 6 — Quality criteria for each classification of Chili sauce

Category	Criteria
Property	Being as follows: **a)** The flavor and the taste, and the color and the luster is good, and there is no an objectionable taste or odor; **b)** The tissue of tomato pulp and vegetables other than tomato are soft, and the tomato that has been chopped or has been roughly crushed are sized uniformly, and tomato seeds are distributed uniformly; **c)** There are few impurities.
Soluble solids	30 % or more, when tested by the method specified in 5.3.
Content percentage of vegetables other than tomato	5 % or more
Ingredients	Not using ingredients other than those listed below: **a)** tomato (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method); **b)** onion, garlic, sweet pepper, celery, or other vegetables; **c)** salt; **d)** spices; **e)** brewed vinegar; **f)** sorts of sugar.
Additives	Same as the criteria for the additives in Table 2
Net contents	Same as the criteria for the net contents in Table 1
Conditions of a container	Same as the criteria for the conditions of a container in Table 3

4.7 Solid tomato

The quality of Solid tomato shall conform to the quality criteria for each classification of Table 7.

Table 7 — Quality criteria for each classification of Solid tomato

Category	Criteria
Property	Being as follows: **a)** The flavor and the taste, and the color and the luster is good, and there is no an objectionable taste or odor; **b)** The condition of texture is moderate, and, in the case of whole or diced tomato, the shape and the uniformity is good; **c)** There are few impurities.
Shape	Being the whole, the diced or the irregular shaped
Content percentage of vegetables other than tomato	Less than 10 %
Peels	Being sufficiently removed.
Liquid packing medium	Not adding water to the medium for those pickled in tomato juice, tomato puree or tomato paste
Ingredients	Not using ingredients other than those listed below: **a)** tomato (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method); **b)** tomato juice (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method), tomato puree and tomato paste (the lycopene content of which is 7 × 10 mg/kg or more, when being extracted with the organic solvent and then measured by the spectrophotometric method, in the case of the soluble solids excluding salt of the tomato puree or the tomato paste being adjusted to 4,5%); **c)** celery, sweet pepper, onion, or other vegetables; **d)** salt; **e)** sorts of sugar; **f)** spices.
Additives	Same as the criteria for the additives in Table 2
Net contents	Same as the criteria for the net contents in Table 1
Conditions of a container	Same as the criteria for the conditions of a container in Table 3

5 Test methods

5.1 General

Reagents and apparatus for the testing shall be as follows:

a) **Water,** grade A2 specified in JIS K 0557, or of equivalent or higher quality.

b) **Reagents,** conforming to the standards such as the special grade of Japanese Industrial Standards.

c) **Volumetric glassware,** class A specified in JIS R 3505, or of equivalent or higher quality.

d) **Potentiometric titrator,** with a burette capacity of 20 mL or more. Use an indicator electrode (silver electrode etc.) and a reference electrode, both suitable for chloride measurement, or a composite electrode thereof.

e) **Filter paper,** No.2 specified in JIS P 3801.

f) **Sugar refractometer**, with the limit deviation being within ±0,05 %.

5.2 Soluble solids excluding salt

5.2.1 Salt content

The measurement shall be either of the following methods; provided, however, that, 5.2.1 b) is applicable to tomato juice which does not leave a reddish color after the filtration:

a) **Potentiometric titration method**

1) **Measurement procedure**

The measurement procedure shall be as follows:

1.1) Take, 5 mL with a volumetric pipette on tomato juice and tomato mixed juice, 15 mL with a volumetric pipette on tomato juice and tomato mixed juice, both of which any salt has not been added to, and weigh, to the nearest 1 mg, 5 g on tomato puree and tomato paste, in a beaker of capacity between 100 mL and 200 mL;

1.2) Add water to immerse the electrode to the beaker [hereinafter referred to as the "sample solution" in 5.2.1 a)], attach the beaker to the potentiometric titrator, and titrate the sample solution with a 0,05 mol/L or 0,1 mol/L silver nitrate solution while stirring the solution, and detect the end point according to the operation of the titrator. Carry out the blank test, by following the same procedure with water in place of the sample solution. When the end point is not detected in the blank test, the titration value shall be 0 mL.

2) **Calculation**

The salt content is given by the following formula:

2.1) **Salt content per 1 g of tomato puree and tomato paste**

$$S = \frac{T-B}{1\,000} \times A \times M \times F \times \frac{1}{W} \times 100$$

2.2) **Salt content per 1 mL of tomato juice and tomato mixed juice**

$$S = \frac{T-B}{1\,000} \times A \times M \times F \times \frac{1}{V} \times 100$$

where

S is the salt content (%);

T is the volume of the silver nitrate solution required for the titration of the sample solution (mL);

B is the volume of the silver nitrate solution required for the titration of the blank test (mL);

A is the concentration of the silver nitrate solution used for the titration (mol/L);

M is 58,44 (the formula weight of sodium chloride);

F is the factor of the silver nitrate solution;

W is the mass of the sample (g);

V is the sampled volume of the sample (mL).

b) Mohr method

1) Measurement procedure

The measurement procedure shall be as follows:

1.1) Take 5 mL of tomato juice in a 50 mL one-mark volumetric flask with a volumetric pipette, obtain the constant volume by adding water, filtrate it with the filtering paper. Take 10 mL of the filtrate in a porcelain evaporating dish or a conical flask with the volumetric pipette, add 5 mL of water, and adjust the pH value to 7 to 10 by adding 0,05 mol/L sodium carbonate solution [hereinafter referred to as the "sample solution" in 5.2.1 b)];

1.2) Add 1 mL of 2 % potassium chromate solution as an indicator to the 1.1) and titrate it with 0,02 mol/L silver nitrate solution using a 10 mL brown burette. Determine the end point when the color of the solution turns pale orange. Carry out the same procedure with 15 mL of water in place of the sample solution as a blank test. When the color clearly exceeds the end point with addition of a single drop of the titrate solution in the blank test, the titration value shall be 0 mL.

2) Calculation

The salt content is given by the following formula:

$$S = \frac{T-B}{1\,000} \times A \times M \times F \times \frac{50}{10} \times \frac{1}{V} \times 100$$

where

S is the salt content (%);

T is the volume of the silver nitrate solution required for the titration of the sample solution (mL);

B is the volume of the silver nitrate solution required for the titration of the blank test (mL);

A is the concentration of the silver nitrate solution used for the titration (mol/L);

M is 58,44 (the formula weight of sodium chloride);

F is the factor of the silver nitrate solution;

V is the sampled volume of the sample (mL).

5.2.2 Soluble solids excluding salt

The soluble solids excluding salt shall be the value given by subtracting the salt content (see 5.2.1) from the soluble solids content (see 5.3).

5.3 Soluble solids content

The soluble solids content shall be the reading with a sugar refractometer at 20 °C, expressed as a percentage terms.

5.4 Drained weight

The drained weight shall be as follows:

a) In the case of canned products

The mass calculated by subtracting the mass of the can from the mass measured by cutting open the can, tilting it and leaving it at that position for 2 min, and then having the solution flow out of the can.

b) In the case of bottled products

The mass calculated by subtracting the mass of a container from the mass measured by opening the lid, tilting the bottle and leave it at that position for 2 min, and then having the solution flow out of the container.