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DRAFT STANDARD FOR PUBLIC COMMENT

(වෙනස්වීමට ඉඩ ඇත, திருத்தத்திற்குட்படக்கூடியது, Liable to alteration)

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வெளியிட்டுத் திகதி
Date of Issue } 2024-12-06

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அபிப்பிராயங்களை தெரிவிப்பதற்கான இறுதித்திகதி
Latest Date for Receipt of Comments } 2025-02-06

SRI LANKA STANDARDS INSTITUTION
GUARDIAN OF QUALITY

Draft Sri Lanka Standard
SPECIFICATION FOR PICKLE
(DSLS 399 :) (Second Revision)

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இவ்வரைவு இலங்கைக் கட்டளையெனக் கருதப்படவோ அன்றிப் பிரயோகிக்கப்படவோ கூடாது
This draft should not be regarded or used as a Sri Lanka Standard.

අදහස් එවිය යුත්තේ : ශ්‍රී ලංකා ප්‍රමිති ආයතනය, 17, වික්ටෝරියා පෙදෙස, ඇල්විටිගල මාවත, කොළඹ 08.

Comments to be sent to: SRI LANKA STANDARDS INSTITUTION, 17, VICTORIA PLACE, ELVITIGALA MAWATHA, COLOMBO 08.

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Introduction

This Draft Sri Lanka Standard has been prepared by the Sri Lanka Standards Institution and is now being circulated for technical comments to all interested parties.

All comments received will be considered by the SLSI and the draft if necessary, before submission to the Council of the Institution through the relevant Divisional Committee for final approval.

The Institution would appreciate any views on this draft which should be sent before the specified date. It would also be helpful if those who find the draft generally acceptable could kindly notify us accordingly.

All Communications should be addressed to:

The Director General
Sri Lanka Standards Institution,
17, Victoria Place,
Elvitigala Mawatha,
Colombo 08.

Draft SRI LANKA STANDARD
SPECIFICATION FOR PICKLE
(*Second Revision*)

DSLS 399:

Gr.

SRI LANKA STANDARDS INSTITUTION
No 17, Victoria Place
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Sri Lanka

DSLS 399:

Draft SRI LANKA STANDARD
SPECIFICATION FOR PICKLE
(*Second Revision*)

FOREWORD

This Standard was approved by the Sectoral Committee on Food Products and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on ……

This Standard was first published in 1976 and revised in 1994. In this second revision, new product types have been accommodated to cater to the market requirements. Requirements for physical, chemical and microbiological parameters have been revised/ introduced to safeguard the consumers.

This Standard is subject to the regulations framed under the Food Act No. 26 of 1980.

For the purpose of deciding whether a particular requirement of this Standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with **SLS 102**. The number of significant figures retained in the rounded off value should be the same as that of the specified value.

In the preparation of this Standard, the assistance derived from the following publications is gratefully acknowledged:
CXS 260-2007 Codex Standard for pickled fruits and vegetables
IS 3501: 1966 Indian Standard Specification for pickles

1 SCOPE

This Standard specifies requirements and methods of sampling and test for pickles.

2 REFERENCES

SLS	79	Edible iodized/ non-iodized salt (granular form)
SLS	80	Edible iodized salt (powdered form)
SLS	102	Rules for rounding off numerical values
SLS	143	Code of practice for general principles of food hygiene
SLS	168	Coconut vinegar
SLS	191	White sugar
SLS	209	Code of hygienic practice for the manufacture of fruit and vegetable products (processed)
SLS	313	Methods for analysis of animal and vegetable fats and oils Part 3: Determination of foreign substances and parameters effecting quality and stability

Section 7: Determination of peroxide value - Iodometric (visual) end point determination
SLS 428 Random sampling methods
SLS 464 Honey
SLS 516 Methods of test for microbiology of food and animal feeding stuffs
Part 1: Horizontal method for the enumeration of microorganisms
Section 1: Colony count at 30℃ by the pour plate technique
Part 2: Horizontal method for the enumeration of yeast and moulds
Section 1: Colony count technique in products with water activity greater than 0.95
Part 3: Horizontal method for the detection and enumeration of coliforms
Section 1: Most probable number technique
Part 5: Horizontal method for the detection of *Salmonella* spp.
Part 12: Horizontal method for the detection and enumeration of presumptive *Escherichia coli* (most probable number technique)
SLS 614 Potable water
SLS 625 Artificial vinegar
SLS 883 Brown sugar
SLS 1701 Treacle
Part 1: Kithul
Part 2: Coconut
Part 3: Palmyrah
SLS 1810 Jaggery
Part 1: Kithul
Part 2: Coconut
Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC), 21st Edition, 2019

3 DEFINITIONS

For the purpose of this Standard, the following definitions shall apply:

3.1 pickle/ unfermented pickle: Product prepared from sound, clean and edible fruits and/ or vegetables with or without seeds, spices and/ or aromatic herbs and condiments and preserved in brine, vinegar, edible oil or citrus and/ or other juices or a combination of these. The product may be further preserved by pasteurization.

3.2 fermented pickle: Processed or treated product of **3.1** preserved through natural or controlled fermentation or added acidulants and may be further preserved by pasteurization.

4 TYPES

Pickle shall be of the following four types:
4.1 Pickle in vinegar

4.2 Pickle in citrus juice or fruit juices
4.3 Pickle in brine
4.4 Pickle in edible oil

NOTE
Above four types may be processed as fermented or unfermented.

5 INGREDIENTS

5.1 *Fruits and/ or vegetables,* fresh or cured

5.2 *Vinegar*, conforming to **SLS 168** or **SLS 625**

5.3 *Edible salt*, conforming to **SLS 79** or **SLS 80**

5.4 *Citrus fruit juice/ other fruit juices*, freshly prepared

5.5 *Edible oils*, conforming to relevant Sri Lanka Standard Specification

5.6 *Potable water*, conforming to **SLS 614**

5.7 *Sugar*, conforming to **SLS 191** or **SLS 883**

5.8 *Jaggery*, conforming to **SLS 1810**

5.9 *Treacle*, Conforming to **SLS 1701**

5.10 *Honey*, conforming to **SLS 464**

5.11 *Spices, condiments and herbs,* conforming to relevant Sri Lanka Standard Specification

5.12 *Edible nuts*, conforming to relevant Sri Lanka Standard Specification

6 ADDITIVES

6.1 Preservatives

6.1.1	*Sodium sorbate*	INS 201	Collective value shall not exceed 1,000 mg/ kg
	Potassium sorbate	INS 202	
	Calcium sorbate	INS 203	

6.1.2	*Sodium sulphite*	INS 220	Collective value shall not exceed 100 mg/ kg
	Sodium hydrogen sulphite	INS 222	
	Sodium metabisulphite	INS 223	
	Potassium metabisulpite	INS 224	
	Potassium sulphite	INS 225	
	Potassium hydrogen sulphite	INS 228	
	Calcium sulphite	INS 226	
	Calcium hydrogen sulphite	INS 227	
6.1.3	*Sodium propionates*	INS 281	Limited by GMP
	Calcium propionate	INS 282	
	Potassium propionate	INS 283	
6.2	Acidity regulators		
6.2.1	*Acetic acid*	INS 260	Limited by GMP
6.2.2	*Sodium acetate*	INS 262 (i)	
6.2.3	*Citric acid*	INS 330	
6.2.4	*Trisodium citrate*	INS 331 (iii)	
6.2.5	*Lactic acid*	INS 270	
6.2.6	*Malic acid*	INS 296	
6.3	Firming agent		
6.3.1	*Calcium chloride*	INS 509	Limited by GMP
6.4	Antioxidants		
6.4.1	*Ascorbyl palmitate****	INS 304	Limited by GMP

Permitted only for pickles in edible oil

7 REQUIREMENTS

7.1 Hygiene

Pickle shall be prepared under hygienic conditions as prescribed in **SLS 143** and **SLS 209**.

7.2 General requirements

7.2.1 Pickle shall possess a colour, aroma and flavour characteristic to the product. It shall be free from off aroma and off flavours.

7.2.2 Pickle shall be free from any discoloration or blackening. It shall be free from foreign matter, fungal growth and insect infestations.

7.2.3 Fruits and vegetables after processing shall possess a firm texture. It shall not be unduly firm.

7.2.4 Pickle shall be free from added colouring substances and artificial sweeteners.

7.2.5 Pickle shall contain not less than 65 per cent drained mass of the net mass when tested according to the method prescribed in Appendix **B**.

NOTE
In the case of whole fruit/ vegetable, drained mass may not be less than 60 *per cent.*

7.2.6 Fill of the container

The container should be well-filled with the product including packing medium, when applicable, which shall occupy not less than 90 per cent of the water capacity of the container, when tested according to the method given in Appendix **C**.

NOTE
In the case of whole fruit/ vegetable, the value shall not be less than 60 *per cent of the water capacity of the container.*

7.2.7 The product shall comply with the requirements specified in Table **1**, when tested according to the methods given in Column **4** of the table.

Table 1 – Requirements for pickle

Sl No (1)	**Characteristic** (2)	**Requirement** (3)	**Method of test** (4)
i)	Acidity of fluid portion, per cent by mass,		
	a) Pickle in vinegar, as Acetic acid, max.	3.0	Appendix **D**
	b) Pickle in citrus juice, as anhydrous Citric acid, min.	1.2	
	c) Pickle in combination of vinegar and citrus juice as Acetic acid, max.	3.0	
ii)	Sodium chloride, per cent by mass, max.	10.0	Appendix **E**
iii)	pH at 25 °C, max.	4.6	Appendix **F**
iv)	Oil content*, per cent by mass, min.	10	Appendix **G**
v)	Peroxide value*, meq/ kg, max.	10.0	Appendix **H**
vi)	Sorbates as Sorbic acid, mg/ kg, max.	1000	**AOAC 983.16**
vii)	Sulphates as SO_2, mg/ kg, max.	100	**AOAC 990.28**

***** *Applicable only for pickles in edible oil*

8 CONTAMINANTS

8.1 Microbiological limits

The product shall not exceed the limits given in Table **2** when tested according to the methods given in Column **4** of the table.

TABLE 2 – Microbiological limits for pickle

Sl No (1)	**Organism** (2)	**Limit** (3)	**Method of test** (4)
i)	Aerobic plate count, cfu/ g, max.	1×10^4	**SLS 516 Part 1 Section 1**
ii)	Coliforms, MPN per g, max.	10	**SLS 516 Part 3 Section 1**
iii)	*Escherichia coli*, MPN per g	Absent	**SLS 516 Part 12**
iv)	Yeast and moulds, cfu/ g, max.	1×10^2	**SLS 516 Part 2 Section 1**
iv)	*Salmonella* spp., per 25 g	Absent	**SLS 516 Part 5**

8.2 Potentially toxic elements

The product shall not exceed the limits for potentially toxic elements given in Table **3** when tested according to the methods given in Column **4** of the table.

TABLE 3 - Limits for potentially toxic elements

Sl No (1)	**Potentially toxic element** (2)	**Limit** (3)	**Method of test** (4)
i)	Arsenic as As, mg/ kg, max.	1.0	**AOAC 986.15** or **2013.06**
ii)	Cadmium as Cd, mg/ kg, max.	0.1	**AOAC 999.11** or **2013.06**
iii)	Lead as Pb, mg/ kg, max.	0.5	**AOAC 994.11** or **2013.06**
iv)	Tin* as Sn, mg/ kg, max.	250	**AOAC 985.16** or **2013.06**

***** *Applicable only for canned products*

9 PACKAGING

The product shall be packaged in suitable, clean, acid resistant and non-reactive food grade containers under strict hygienic conditions and shall be sealed air-tight.

10 MARKING AND/ OR LABELLING

Each package shall be marked and/ or labelled legibly and indelibly or a label shall be attached to the package with the following information.

a) Common name of the product as "Pickle", including the name of the fruit/ vegetable (e.g.: Mango pickle) or traditionally accepted name (e.g.: Malay pickle, Sinhala pickle);
b) Packing medium as any of the following, in close proximity to the common name of the product, in-case of clearly distinguishable packing medium;
"in vinegar"
"in citrus juice or fruit juices"
"in brine"
"in edible oil "
c) Brand name;
d) Net mass, in grams; .
e) Name and address of the manufacturer/ distributor (including the country of origin);
f) Batch number or code number or a decipherable code marking;
g) Date of manufacture;
h) Date of expiry;
j) Food additives name and INS number, if any; and
k) List of ingredients, in descending order of proportion.

11 METHODS OF TEST

Tests shall be carried out in accordance with the methods prescribed in **Appendix B**, **C**, **D**, **E**, **F, G** and **H** of this Standard, Section **1** of Part **1**, Section **1** of Part **2**, Section **1** of Part **3**, Part **5** and Part **12** of **SLS 516** and Official methods of Analysis, Association of Official Analytical Chemists (AOAC) official methods of analysis, 21st edition, 2019.

12 CRITERIA FOR CONFORMITY

12.1 Each container inspected as in clause **A.5.1** satisfies the packaging, marking and/ or labeling requirements.

12.2 Each container tested as in **A.5.2** satisfies the requirements given in Clauses **7.2.1**, **7.2.2**, **7.2.3** and **7.2.4**.

12.3 Each container tested as in **A.5.3** satisfies the requirements given in Clauses **7.2.5**, **7.2.6** and serial number **i)**, **ii)**, **iii)** and **iv)** of **Table 1**.

12.4 The composite sample tested as in **A.5.4** satisfies the requirements given serial number **vi)** and **vii)** of **Table 1** and Clause **8.2**.

12.5 Each container tested as in **A.5.5** satisfies the microbiological requirements given in Clause **8.1**.

APPENDIX A
COMPLIANCE OF A LOT

A.1 LOT

In any consignment all the containers belonging to one batch of manufacture or supply shall constitute a lot.

A.2 GENERAL REQUIREMENTS OF SAMPLING

In drawing, preparing, storing and handling samples, following precautions and directions shall be taken.

A.2.1 Samples shall be drawn in a protected place not exposed to damp, air, dust or soot.

A.2.2 The sampling instruments shall be cleaned and dried when use. When drawing samples for microbiological examination, the sampling instruments shall be sterilized.

A.2.3 Precautions shall be taken to protect the samples, the product being sampled and the sample container from adventitious contamination.

A.2.4 The samples shall be placed in clean and dry containers. The size of the sample containers shall be of such size that they are almost completely filled by the sample. When drawing samples for microbiological examination, the sample containers shall be sterilized.

A.2.5 The sample containers shall be sealed, air-tight after filling and marked with necessary details of sampling.

A.2.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the room temperature.

A.3 SCALE OF SAMPLING

A.3.1 Samples shall be tested from each lot for ascertaining its conformity to the requirements of this Standard.

A.3.2 The number of containers to be selected from a lot shall be in accordance with Table **4**.

A.3.3 In addition to the **A.3.2**, five containers shall be drawn randomly for the microbiological tests.

A.3.4 The containers shall be selected at random. In order to ensure randomness of selection tables of random numbers as given in **SLS 428** shall be used.

TABLE 4 - Scale of sampling

Number of containers in the lot (1)	Number of containers to be selected (2)	Size of the sub sample (3)
Up to 280	13	3
281 to 500	20	4
501 to 1 200	32	5
1 201 and above	50	6

A.4 REFERENCE SAMPLES

If a reference sample is required, the number of packages to be selected from a lot shall be three times the number given in Column **2** of **Table 4** (*see* **Note**). The packages so selected shall be divided into three equal parts. One of these parts shall be marked for the purchaser, one for the supplier and the third for reference.

NOTE
In case of microbiological requirements, a reference sample is not required.

A.5 NUMBER OF TESTS

A.5.1 Each container selected as in **A.3.2** or **A.3.3** shall be inspected for packaging and marking and/ or labeling requirements.

A.5.2 Each container selected as in **A.3.1**, **A.3.2** or **A.3.3** shall be inspected for the requirements given in Clauses **7.2.1**, **7.2.2**, **7.2.3** and **7.2.4**.

A.5.3 A sub-sample selected as per the column **3** of **Table 4**, shall be individually tested for the requirements given in Clauses **7.2.5**, **7.2.6** and serial number **i)**, **ii)**, **iii)** and **iv)** of **Table 1**.

A.5.4 A composite sample shall be prepared for the remaining containers as selected in **A.3.2**, and shall be tested for the requirements given in serial number **v)**, **vi)** and **vii)** of **Table 1** and Clause **8.2**.

A.5.5 Microbiological sample as drawn in **A.3.4** shall be individually tested for the requirements given in Clause **8.1**.

APPENDIX B
DETERMINATION OF THE DRAINED MASS

B.1 APPARATUS

B.1.1 *Sieve* 2.0 mm, conforming to **SLS 124**

B.1.2 *Flask*

B.1.3 *Weighing scale*

B.2 PROCEDURE

Take whole content of the container of the representative sample in a flask and stir it with boiling water (four times of the weight of the sample) for about two minutes and transfer to the previously weighed sieve. Allow to drain for two minutes. Weigh the sieve along with the remaining portion and calculate the percentage of fruit content.

B.3 CALCULATION

$$\textit{Drained mass}, \text{ per cent by mass} = \frac{m_1 - m_2}{M} \times 100$$

where,

M is the mass, in grams, of the sample taken;

m_1 is the mass, in grams, of the sieve and the fruit content; and

m_2 is the mass, in grams, of the sieve.

APPENDIX C
DETERMINATION OF WATER CAPACITY OF CONTAINERS

C.l METAL CONTAINERS

C.1.1 PROCEDURE

C.1.1.1 Select a container which is undamaged in all respects. Cut out the lid without removing or altering the height of the double seam. Determine the average vertical distance from the top of the container to the top level of the contents by taking measurements over the surface of the contents. This distance is the gross head space in containers with double seams, in which case**,**

The net head space = Gross head space - 4.8 mm

C.1.1.2 Empty the contents of the container so examined. Wash, dry and weigh the empty container *(m_1).* Fill the container with distilled water at 27 °C up to 4.8 mm vertical distance below the top level of the container and weigh the container thus filled *(m_2).* The water capacity of the

container, expressed in milliliters of water shall be the difference between the two weighing *(m_2- m_1)*.

C.1.1.3 Draw off the water from this filled container to the level of the contents as determined in **C.1.1.1**. Determine the mass of the container with the remaining water *(m_3)*.

C.1.2 CALCULATION

$$\text{Fill of the container, as per cent of the water capacity of the container} = \frac{m_3 - m_1}{m_2 - m_1} \times 100$$

where,

m_1 is the mass,in g, of the empty container;

m_2 is the mass,in g, of the container filled with water (**C. 1.1.2**); and

m_3 is the mass, in g, of the container with remaining water (**C. 1.1.3**).

C.2 GLASS CONTAINERS

C.2.1 PROCEDURE

C.2.1.1 Select a container which is undamaged in all respects and remove the lid. Determine the average vertical distance from the top level of the container to the top level of the contents. This distance is the net headspace in vacuum sealed jars.

C.2.1.2 Empty the container, dry and weigh the empty container (m_1). Fill the container with distilled water at 27 °C to the level of the top and weigh the container thus filled (m_2). The water capacity of the container, expressed in milliliters of water shall be the difference between the two weighing (m_2 - m_1).

C.2.1.3 Proceed as in **C.1.1.3** and calculate the fill of the container as in **C.1.2**.

APPENDIX D
DETERMINATION OF ACIDITY

D.1 REAGENTS

D.1.1 *Sodium hydroxide*, standardized, c (NaOH) = 0.1 mol/ 1 solution.

D.1.2 *Phenolphthalein indicator solution* (0.1 g of phenolphthalein dissolved in 100 ml of 60 per cent rectified spirit)

D.2 PROCEDURE

Weigh, to the nearest milligram, about 10 g of well mixed fluid portion into an Erlenmeyer flask. Add 100 ml of water and mix thoroughly. Titrate against sodium hydroxide **(D.1.1)** using

phenolphthalein **(D.1.2)** as the indicator.

D.3 CALCULATION

D.3.1 *Acidity, as acetic acid*, per cent by mass $= \frac{V \times c \times 6.04}{m}$

D.3.2 *Acidity, as anhydrous citric acid*, per cent by mass $= \frac{V \times c \times 6.40}{m}$

where,

V is the volume, in ml, of Sodium hydroxide solution required for the titration;
c is the concentration, in mol/ 1, of the Sodium hydroxide solution; and
m is the mass, in g, of the test portion.

APPENDIX E
DETERMINATION OF SODIUM CHLORIDE

E.1 REAGENTS

E.1.1 *Ethyl alcohol*

E.1.2 *Nitric acid*, concentrated

E.1.3 *Silver nitrate solution*, standardized, c($AgNO_3$) = 0.1 mol/ 1

E.1.4 *Ferric alum indicator solution*

E.1.5 *Ammonium thiocyanate solution*, c(NH_4CNS) = 0.1 mol/ 1, standardized

E.2 PROCEDURE

Weigh, to the nearest milligram, about 5.0 g of the well-mixed fluid portion and transfer to a 100-ml graduated flask with approximately 50 ml of 80 per cent alcohol. Shake well to suspend all insoluble material. Add 1 ml of nitric acid (**E.1.2**). Using a pipette add excess of known volume of Silver nitrate (**E.1.3**). Dilute to 100 ml with alcohol. Transfer to a centrifuge bottle and centrifuge for five minutes at approximately 1800 rev/ min.

Pipette 50 ml of the supernatant liquid into a 300 ml Erlenmeyer flask. Add 2 ml of concentrated nitric acid and 2 ml of ferric alum indicator solution (**E.1.4**). Titrate with ammonium thiocyanate (**E.1.5**) to a permanent light brown colour.

E.3 CALCULATION

$$\textit{Sodium chloride}, \text{ per cent by mass} = \frac{(m_1 V_1 - 2 m_2 V_2)\, 5.85}{m}$$

where,

V_1 is the volume, in ml, of the standard Silver nitrate solution;
m_1 is the concentration, in mol/ 1, of the standard Silver nitrate solution;
V_2 is the volume, in ml, of the standard Ammonium thiocyanate solution;
m_2 is the concentration, in mol/ 1, of the standard Ammonium thiocyanate; and
m is the mass, in g, of the test portion.

APPENDIX F
DETERMINATION OF pH

F.1 PROCEDURE

Blend the total content of the product in the container. Weigh 10 g of the blended product to the nearest milligram into a beaker. Add 100 ml of distilled water and mix thoroughly. Allow the mixture to settle for 1 hour.

Take out the liquid portion and measure pH at 25 °C.

APPENDIX G
DETERMINATION OF THE OIL CONTENT

G.1 REAGENTS

G.1.1 *Petroleum ether*

G.1.2 *Anhydrous Sodium sulphate*

G.2 APPARATUS

G.2.1 *Sieve,* 500 µm

G.2.2 *Evaporating dish,* silica or Platinum

G.2.3 *Weighing scale*

G.3 PROCEDURE

Measure the total mass of the product in the container. Empty the whole content onto the sieve (**G.2.1**) and collect the liquid (oil) portion. Wash with 100 ml of hot water. Extract the fluid portion with petroleum ether. Filter the organic layer through anhydrous Sodium sulphate. Evaporate the filtrate on a previously weighed dish and take the weight of the oil content.

G.4 CALCULATION

$$\textit{Oil content}, \text{ percent by mass } = \frac{m_1 - m_2}{M} \times 100$$

where,

m_1 is the mass of the dish with oil;
m_2 is the mass of the empty dish; and
M is the total mass of the sample.

APPENDIX H
DETERMINATION OF THE PEROXIDE VALUE

H.1 PROCEDURE

Determine the Peroxide value of oil obtained as in Appendix **G**, using the method given in **Section 7** of **Part 3** of **SLS 313**.
