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Draft Sri Lanka Standard
SPECIFICATION FOR FLAVOURED DRINK POWDER MIXES
(FIRST REVISION) (DSLS 668 :)

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

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Draft Sri Lanka Standard
SPECIFICATION FOR FLAVOURED DRINK POWDER MIXES
(First Revision)

DSLS 668:

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Draft Sri Lanka Standard
SPECIFICATION FOR FLAVOURED DRINK POWDER MIXES
(First Revision)

FOREWORD

This Sri Lanka 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 1984 under the title of specification for soft drink powder mixes. In this first revision, the title of the Standard is replaced by specification for flavoured drink powder mixes, considering this as the best term to describe the product. In addition to that, optional ingredients, limits for acid insoluble ash and potentially toxic elements have been revised.

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

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

In the revision of this Standard, valuable assistance derived from the following publication is gratefully acknowledged.

KS 1773-2018 Kenya Standard - Water based flavoured drink in solid form

1 SCOPE

This Standard prescribes the requirements and methods of sampling and test for flavoured drink powder mixes.

2 REFERENCES

- SLS 102 Presentation of numerical values
- SLS 143 General principles of food hygiene
- SLS 191 White sugar
- SLS 420 Pasta products
- SLS 428 Random sampling methods
- SLS 883 Brown sugar

Official Methods of Analysis, Association of Official Analytical Chemists (**AOAC**) 20th edition, 2016

3 DEFINITION

3.1 flavoured drink powder mixes: Powder mix made of sweetening ingredients and natural and/ or synthetic flavouring substances, which is intended for consumption after reconstitution according to the manufacturer's instructions.

4 INGREDIENTS

4.1 Basic ingredients

4.1.1 Sweetening ingredients

- a) White sugar, conforming to **SLS 191**
- b) Brown sugar, conforming to **SLS 883**
- c) Dextrose
- d) Fructose
- e) Invert sugar

4.1.2 Permitted flavouring substances

4.1.3 Acidulants

- | | | | |
|----|---------------|---------|------------------|
| a) | Citric acid | INS 330 | } Limited by GMP |
| b) | Acetic acid | INS 260 | |
| c) | Ascorbic acid | INS 300 | |
| d) | Tartaric acid | INS 334 | |
| e) | Malic acid | INS 296 | |
| f) | Fumaric acid | INS 297 | |

4.2 Optional ingredients

4.2.1 Edible seeds (Basil - *Ocimum basilicum*)

4.2.2 Vitamins (see 5.5)

4.2.3 Emulsifying, stabilizing or thickening agents

- | | | | |
|----|-------------|---------|------------------|
| a) | CMC | INS 468 | } Limited by GMP |
| b) | Xanthum gum | INS 415 | |

4.2.4 Anti-caking agents

- | | | | |
|----|----------------------------|---------|----------------|
| a) | Silicon dioxide, amorphous | INS 551 | Limited by GMP |
|----|----------------------------|---------|----------------|

4.2.5 Buffering agents

- | | | | |
|----|----------------------|--------------|------------------|
| a) | Sodium citrate | INS 331(iii) | } Limited by GMP |
| b) | Tricalcium phosphate | INS 341(iii) | |

4.2.6 *Cloudifying agents*

- a) Titanium dioxide INS 171 Limited by GMP

NOTE

Brominated vegetable oil is not permitted.

4.2.7 *Permitted colouring substances*

4.2.8 *Foaming agents*

4.2.9 *Bulking agents*

- a) Maltodextrins

4.2.10 *Permitted sweeteners*

4.2.11 *Vermicelli*, conforming to **SLS 420**

4.2.12 *Whey powder*

5 REQUIREMENTS

5.1 Hygiene

Flavoured drink powder mixes shall be processed, packaged, stored and distributed under hygienic conditions in accordance with **SLS 143**.

5.2 Appearance

The product shall be a homogeneous and free flowing powder. It shall be free from dirt and extraneous matter.

5.3 Odour and flavour

The product, before and after reconstitution as per the labelling instructions shall have a pleasant, characteristic odour and flavour. The odour and flavour shall be in accordance with any claim made or implied on the label. It shall be free from off odours and off flavours.

5.4 Other requirements

The product shall comply with the requirements given in Table **1** when tested in accordance with the methods given in Column **4** of the table.

TABLE 1- Requirements for flavoured drink powder mixes

SI No (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Moisture, per cent by mass, max.	1.0	Annexure B
ii)	Sulfated ash, per cent by mass, max.	2.0	Annexure C
iii)	Acid insoluble ash, per cent by mass, max.	0.05	Annexure D
iv)	Solubility (at ambient temperature), per cent by mass, min.	95.0	Annexure E
v)	Acidity (calculated as anhydrous citric acid), per cent by mass, max.	3.5	Annexure F

5.5 Vitamin C content

The Vitamin C content shall be not less than 30 mg/ 100 ml of the reconstituted product, when tested as specified in Appendix **G**.

NOTE

This requirement only apply to products which are implied or claimed as fortified with Vitamin C.

6 CONTAMINANTS

6.1 Potentially toxic elements

The product shall not exceed the limits given in Table 2 when tested in accordance with the methods given in Column 4 of the table.

TABLE 2 - Potentially toxic elements

SI No (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Arsenic as As, mg/ kg, max.	1.0	AOAC 986.15/AOAC 2013.06
ii)	Lead as Pb, mg/ kg, max.	1.0	AOAC 999.10/AOAC 2013.06
iii)	Cadmium as Cd, mg/ kg, max.	0.1	AOAC 999.10/AOAC 2013.06
iv)	Tin as Sn, mg/ kg, max.*	50	AOAC 20013.06

**Applicable, if the product is packaged in cans*

7 PACKAGING

The product shall be packaged in suitable food grade containers, which shall not affect the quality of the product and shall be sealed and air tight.

8 MARKING AND/ OR LABELLING

8.1 The following shall be marked and/ or labeled legibly and indelibly on each package:

- a) Name of the product, as “*X-Flavoured drink powder mix*” “or *X- Flavoured instant drink powder mix*” (*where X- denotes the flavour used*);
- b) Brand name or trade mark, if any;
- c) Net mass, in grams or kilograms;
- d) Name and address of the manufacturer or the distributor;
- e) Country of origin, in case of imported products;
- f) Batch or code number or a decipherable code marking;
- g) Date of manufacture;
- h) Date of expiry;
- j) List of ingredients;
- k) Permitted food additives name and INS number;
- m) Directions for preparation;
- n) Where nutritional claims are made or implied, the nutritional information declaring the total quantity of nutrient per 100 grams of the product before reconstitution, as well as per serving of the reconstituted product;
- p) Information for storage, where necessary; and
- q) Warning statements if any sweeteners added.

8.2 Directions for reconstitution of the product to drinking strength and storage instructions shall appear either on the label of the container or on an accompanying leaflet.

9 METHODS OF TEST

Tests shall be carried out as methods prescribed in the Appendix **B** to **G** of this Standard, and Official Methods of Analysis, Association of Official Analytical Chemists (**AOAC**) 20th edition, 2016,

10 CONFORMITY TO STANDARD

A lot shall be declared as conforming to the requirements of this Standard if the following conditions are satisfied:

10.1 Each container examined as in **A.5.1** satisfies the relevant requirements.

10.2 Each container examined as in **A.5.2** satisfies the relevant requirements.

APPENDIX A SAMPLING

A.1 LOT

All containers of one size, containing flavoured drink powder mixes belonging to one batch of manufacture shall constitute a lot.

A.2 GENERAL REQUIREMENTS OF SAMPLING

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

A.2.1 The sample shall be taken in a protected place not exposed to damp air and dust.

A.2.2 The sampling instrument shall be clean and dry when used.

A.2.3 The samples shall be placed in clean and dry glass containers. Each container shall be sealed air-tight after filling and marked with necessary details of sampling.

A.3 SCALE OF SAMPLING

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

A.3.2 The number of containers to be selected from the lot shall be in accordance with Columns 2 and 3 of Table 3.

TABLE 3 - Scale of sampling

Number of containers in the lot (1)	Number of containers to be selected	
	Container size 500 g, or more (2)	Container size less than 500 g (3)
Up to 15	03	05
16 to 25	04	06
26 to 50	05	08
51 to 150	07	10
151 to 300	10	15
301 to 1000	15	20
1 001 and above	20	25

A.3.3 containers shall be selected at random. In order to ensure randomness of selection, random number tables as given in **SLS 428** shall be used.

A.4 PREPARATION OF A COMPOSITE SAMPLE

A.4.1 A small quantity of material shall be drawn from different parts of each container selected as in **A.3.2** using an appropriate sampling instrument.

A.4.2 The material so obtained shall be mixed together and reduced using a suitable method, if necessary, to produce a composite sample of not less than 150 g.

A.5 NUMBER OF TESTS

A.5.1 Each container selected as in **A.3.2** shall be examined for packaging, marking and/ or labelling requirements.

A.5.2 The composite sample obtained as in **A.4** shall be examined for requirements given in **5.2, 5.3, 5.4, 5.5** and **6**.

APPENDIX B DETERMINATION OF MOISTURE CONTENT

B.1 PROCEDURE

B.1.1 Preparation of sample

Mince as quickly as possible with a sharp-edged knife or grind in a dry pestle and mortar 150 g of the sample on a clean porcelain slab. Mince thoroughly to secure a uniform sample. Store the minced sample immediately in an air-tight glass container and use this wherever the use of prepared sample is indicated.

B.1.2 Weigh to the nearest milligram about 5g of the prepared sample (**B.1**) in a tared weighing bottle having a diameter of about 40 mm and a height of about 25 mm. Distribute the material as evenly as practicable over the bottom of the bottle by gentle sidewise movements. Place the bottle in a vacuum oven, remove the cover of the bottle and dry the material for six hours at 80 ± 1 °C at a pressure not exceeding 5 mmHg. Allow the bottle to cool to room temperature and weigh.

B.2 CALCULATION

B.2.1 Moisture, per cent by mass =
$$\frac{100 (m - m_1)}{m}$$

where

m = mass in g, of the prepared sample taken for the experiment; and
 m_1 = mass in g, of the material after drying for six hours.

APPENDIX C DETERMINATION OF SULPHATED ASH

C.1 REAGENT

C.1.1 Concentrated Sulphuric acid, specific gravity 1.84

C.2 PROCEDURE

Weight to the nearest milligram about 5 g of the prepared sample (see **B.1.1**) into a 9 cm diameter platinum or silica dish. Add a few drops (about 1.5 ml) of concentrated Sulphuric acid to the material in the dish. Gently heat the dish on a hot plate until the material is well carbonized, and then increase the heat until the evolution of Sulphuric acid fumes ceases. Ash the carbonized matter in a muffle furnace at 600 ± 20 °C. Cool the ash and moisten it with a few drops of concentrated Sulphuric acid, heat strongly on a hot plate until Sulphuric acid fumes cease to be evolved and finally ash in the muffle furnace at 600 ± 20 °C for 2 hours. Cool in a desiccator and weigh. Heat again in the muffle furnace for 30 minutes at 600 ± 20 °C. Repeat the process of heating in the muffle furnace for 30 minutes cooling and weighing till the difference between two successive weighings is less than 10 mg. Record the lowest weight.

C.3 CALCULATION

C.3.1 Ash, sulphated, per cent by weight = $\frac{100 - m_1}{m_2}$

where

m_1 = mass in g, of the ash; and

m_2 = mass in g, of the prepared sample taken for the test.

APPENDIX D DETERMINATION OF ACID INSOLUBLE ASH

D.1 REAGENT

D.1.1 Dilute Hydrochloric acid, approximately 5 M (prepared from concentrated Hydrochloric acid)

D.2 PROCEDURE

Weight to the nearest milligram about 20 g of the prepared sample (see **B.1.1**) in a tared, clean and dry porcelain dish. Ignite the material in the dish with the flame of a Meker burner for about one hour. Complete the ignition by keeping in a muffle furnace at 600 ± 20 °C until grey ash results. cool in a desiccator. To the ash, add 25 ml of the dilute hydrochloric acid, cover with a watch-glass and heat on a water-bath for 10 minutes. Allow to cool and filter the contents

of the dish through whatman filter No.42 or its equivalent. Wash the filter with water until the washings are free from chlorides. Return the filter and the residue to the dish. Keep it in an air-oven maintained at $105 \pm 2^\circ \text{C}$ for about 3 hours. Ignite in the muffle furnace at $600 \pm 20^\circ \text{C}$ for one hour. Cool the dish in a desiccator and weigh. Heat again for 30 minutes in the muffle furnace, cool and weigh. Repeat this process of heating for 30 minutes, cooling and weight till the difference between two successive weighings is less than one milligram. Note the lowest weight.

D.3 CALCULATION

$$\text{D.3.1 Acid insoluble ash, per cent by mass} = \frac{100 - (m_2 - m)}{m_1 - m}$$

Where

m_2 = mass in g, of the porcelain dish with the acid insoluble ash;

m = mass in g, of the empty porcelain dish; and

m_1 = mass in g, of the porcelain dish with the prepared sample taken for the test.

APPENDIX E DETERMINATION OF SOLUBILITY

E.1 PROCEDURE

E.1.1 Reconstitution and separation of insoluble matter

E.1.1.2 Weigh to the nearest milligram, about 5 g of the sample into a dried, tared 50 ml centrifuge tube. Add 10 ml of water and mix well to form a uniform paste, free from lumps, using a glass rod. Add a further 25 ml of water to the centrifuge tube using a portion of it to wash the glass rod completely free of the powder. Close the tube and shake vigorously for 3 minutes. Centrifuge the tube for 15 minutes at $4\,000 \pm 100$ revolutions per minute.

E.1.2 Determination of dissolved solids in supernatant solution

E.1.2.1 Pipette out 5 ml of the Supernatant solution and transfer to a dried and tared glass, aluminum or stainless steel dish provided with a cover. Weigh the dish with the contents and place on a boiling water bath for 15 minutes and transfer the dish to an air oven maintainer at $103 \pm 1^\circ \text{C}$. Dry for 3 hours. Cool the dish in a desiccator and weigh again.

E.1.3 Determination of residue

E.1.3.1 Decant off the remaining solution as completely as possible without disturbing the sediment at the bottom of the tube. Weigh the centrifuge tube with the wet sediment. Dry the contents of the tube by first placing the tube in a boiling water bath and later in an electric oven at $103 \pm 1^\circ \text{C}$ for 3 hours. Cool in a desiccator and weigh. Dry the tube further for 1 hour, cool and weigh. Repeat drying at hourly intervals, cooling and weighing till the difference between two successive weighings does not exceed 1 milligram.

E.2 CALCULATION

$$\text{Solubility per cent by mass} = 100 \frac{100(m_4 - m_2) - y(m_3 - m_4)}{m_1}$$

where,

m_1 = mass, in g, of the material taken for test;

m_2 = mass, in g, of the centrifuge tube;

m_3 = mass, in g, of the centrifuge tube with residue before drying;

m_4 = mass, in g, of the centrifuge tube with residue after drying; and

y = Solids in supernatant liquid, in g per ml (See E.1.2).

APPENDIX F

DETERMINATION OF ACIDITY (AS ANHYDROUS CITRIC ACID)

F.1 REAGENTS

F.1.1 Standard Sodium hydroxide solution, approximately 0.1 M.

F.1.2 Phenolphthalein indicator solution. Dissolve 0.5 g of phenolphthalein in 200 ml of 50 per cent ethyl alcohol by volume.

F.2 PROCEDURE

Weigh, to the nearest milligram, about 10 g of the powder in a suitable dish or basin. Transfer the contents to a conical flask with 100 ml to 150 ml of recently boiled and cooled distilled water. Add 1 ml of phenolphthalein indicator solution and titrate against the standard Sodium hydroxide solution. For observing the colour change at the end point, use another portion of the sample diluted to the same proportion in a similar flask.

F.3 CALCULATION

$$\text{Acidity (as anhydrous citric acid), per cent by mass} = \frac{6.404 VM}{m}$$

where,

V = volume, in ml, of standard Sodium hydroxide required for titration;

M = molarity of the standard Sodium hydroxide solution; and

m = mass, in g, of the sample taken for test.

APPENDIX G DETERMINATION OF VITAMIN C CONTENT

H.1 PRINCIPLE

Vitamin C is extracted and the titration is performed in the presence of $\text{HPO}_3\text{-CH}_3\text{COOH}$ or $\text{HPO}_3\text{-CH}_3\text{COOH-H}_2\text{SO}_4$ solution to maintain proper acidity for reaction and to avoid autoxidation of acid at high pH. Ascorbic acid reduces oxidation-reduction indicator dye 2, 6-dichloroindophenol to a colourless solution. At the end point excess unreduced dye is rose pink in acid solution.

H.2 REAGENTS

H.2.1 Extracting solutions

H.2.1.1 Metaphosphoric acid-acetic acid solution

Dissolve, with shaking, 15 g of HPO_3 pellets or freshly pulverised stick HPO_3 in 40 ml acetic acid and 200 ml water; dilute to approximately 500 ml, and filter rapidly through a fluted paper into a glass-stoppered bottle. (HPO_3 slowly changes to H_3PO_4 , but if stored in a refrigerator, the solution remains satisfactory for 7 to 10 days).

H.2.1.2 Metaphosphoric Acid-acetic acid-Sulphuric acid solution

Proceed as in **H.2.1.1** adding 0.15 M Sulphuric acid in place of water.

H.2.2 Ascorbic acid standard solution (1 mg/ml)

Weigh, to the nearest 0.01 mg, approximately 50 mg USP ascorbic acid reference standard, that has been stored in a desiccator away from direct sunlight. Transfer to a 50-ml volumetric flask. Dilute to volume immediately before use with $\text{HPO}_3\text{-CH}_3\text{COOH}$ solution (see **H.2.1.1**)

H.2.3 Indophenol standard solution

Dissolve 50 mg, of 2, 6-dichloroindophenol sodium salt, that has been stored in a desiccator over soda lime, in 50 ml water to which has been added 42 mg sodium bicarbonate; shake vigorously and when the dye dissolves, dilute to 200 ml with water. Filter through fluted paper into an amber glass-stoppered bottle. Keep stoppered, out of direct sunlight and store in a refrigerator. (Decomposition products that make the end point indistinct occur in some batches of dry indophenol and also develop with time in stock solution. Add 5.0 ml extracting solution containing excess ascorbic acid to 15 ml dye reagent. If reduced solution is not practically colourless, discard, and prepare new stock solutions. If dry dye is at fault obtain new supply).

Transfer three, 2.0 ml portions of Ascorbic acid standard solution to each of three 50-ml Erlenmeyer flasks containing 5.0 ml $\text{HPO}_3\text{-CH}_3\text{COOH}$ solution (see **H.2.1.1**). Titrate rapidly with indophenol solution from a 50-ml burette until light but distinct rose-pink persists for more than 5 seconds. (Each titration should require approximately 15 ml indophenol solution and titrations should check within 0.1 ml).

Similarly titrate three blanks composed of 7.0 ml $\text{HPO}_3\text{-CH}_3\text{COOH}$ Solution (**H.2.1.1**) and a volume of water approximately equal to the volume of Indophenol solution used in direct titrations. After subtracting average blanks (usually approximately 0.1 ml) from standardization titration, calculate and express concentration of Indophenol solution as milligrams of Ascorbic acid equivalent to 1.0 ml reagent. Standardize Indophenol solution daily with freshly prepared Ascorbic acid standard solutions.

H.2.4 Thymol blue pH indicator (0.04 per cent)

Dissolve 0.1 g, indicator by grinding in an agate mortar with 10.75 ml, 0.02M Sodium hydroxide and dilute to 250 ml with water.
Transition range: 1.2 (red) to 2.8 (yellow).

H.3 PRELIMINARY TEST FOR APPRECIABLE QUANTITIES OF BASIC SUBSTANCES

Grind a portion of the sample and add approximately 25 ml of $\text{HPO}_3\text{-CH}_3\text{COOH}$ solution (**H.2.1.1**). Test the pH by placing a drop of Thymol blue pH indicator on the pestle. A pH value higher than 1.2 indicates the presence of appreciable amounts of basic substances.

H.4 PREPARATION OF SAMPLE ASSAY SOLUTION

Reconstitute the product according to the manufactures instructions and take an amount of solution containing approximately 100 mg Ascorbic acid (designate this volume V_0). If appreciable amounts of basic substances are present, adjust pH to approximately 1.2 with solution **H.2.1.2**. Dilute with solution **H.2.1.1** to a measured volume containing 10 mg to 100 mg ascorbic acid per 100 ml of solution. Designate this volume V_3 .

H.5 PROCEDURE

Titrate three sample portions of the solution prepared as in **H.4**, containing approximately 2 mg ascorbic acid and make blank determinations for correction of titrations as in **H.2.3**, using proper volumes of $\text{HPO}_3\text{-CH}_3\text{COOH}$ solution (**H.2.1.1**) and water. If approximately 2 mg ascorbic acid is contained in a portion of the sample assay solution of less than 7 ml, add $\text{HPO}_3\text{-COOH}$ solution to obtain 7 ml for titration. Designate this volume as V_4 .

NOTE

Products containing ferrous (Fe), stannous (Sn) and cuprous (Cu) give values in excess of their actual ascorbic acid content by this method. Following are simple tests to determine whether these reducing ions are present in such amounts so as to invalidate the test.

Add 2 drops of 0.05 aqueous methylene blue solution to 10 ml of freshly prepared sample assay solution and $\text{HPO}_3\text{-CH}_3\text{COOH}$ reagent, and mix. Disappearance of the methylene blue colour in 5 seconds to 10 seconds indicates presence of interfering substances.

Stannous does not answer this test and may be tested as follows: To 10 ml sample solution, add 10 ml HCl (1 + 3), 5 drops of 0.05 aqueous indigo carmine solution and mix. Disappearance of colour in 5 seconds to 10 seconds indicates the presence of Sn or other interfering substances.

H.6 CALCULATION

$$\text{Content of vitamin C(ascorbic acid)} \\ \text{in mg per 100 ml of sample solution} = (V_1 - V_2) \frac{V_1}{V_0} \times \frac{V_3}{V_4} \times 100$$

where,

V_0 = volume, in ml, of prepared sample solution containing 100 mg Ascorbic acid;

V_1 = volume, in ml, of standard Indophenol solution required for the titration;

V_2 = volume, in ml, of standard Indophenol solution required for blank titration.

V_3 = volume, in ml, of initial assay solution.

V_4 = volume, in ml, of solution used for titration.

V_1 = mass, in mg, of ascorbic acid equivalent to 1.0 ml Indophenol standard solution.

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