

Foreword

This Bangladesh Standard was adopted by the Bangladesh Standards and Testing Institution on, after the recommendation by the Sectional Committee for the Fruits, Vegetables and their Derived Products had been approved by the Agricultural and Food Products Divisional Committee.

Sauce (Fruits and Vegetables) refers to a culinary preparation used as an adjunct to food prepared from the edible portion of suitable fruits and/or vegetables, their pulps or purees, or dried forms, blended with nutritive sweeteners, salt, spices, condiments, and other permitted ingredients to impart a characteristic flavor, color, and aroma. Sauces are widely used in Bangladesh as table condiments and cooking ingredients, contributing to the growing processed food sector. Considering their increasing production and consumption, it was considered necessary to revise this standard to ensure that the product conforms to the required quality and safety specifications and to safeguard consumer health.

This standard BDS 512 Sauce (Fruits and Vegetables) was first published in 1991, subsequently revised in 2007 and 2017. The present version represents the third revision of this standard. Major modifications introduced in this revision include the following:

- i) the definition for 'sauce (fruits and vegetables)' has been elaborated;
- ii) the list of ingredients have been reviewed and modified;
- iii) new clauses for 'pesticide residues' and 'compliance' have been incorporated;
- iv) limits for 'preservatives' have been updated;
- v) the parameter for 'acidity' has been deleted and limit for 'pH' have been included;
- vi) microbiological limit for *Salmonella* has been added; and
- vii) requirements for labeling has been modified according to the current practices;

The Sectional Committee responsible for the preparation of this standard has taken into consideration the views of the members of this committee, local producers, consumers and technologists and has related the standard to the manufacturing and trade practices followed in the country in this field.

In the formulation of this standard, considerable assistance has been derived from the following publications which is acknowledged with thanks:

- i. CXS 306-2023 Standard for Chili Sauce
Codex Alimentarius Commission

This standard is subject to periodical reviews and amendments, if necessary, in order to keep pace with the latest industrial and technological innovations. Any suggestions for improvement will be recorded and placed before the committee in due course.

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 BDS 103. The number of significant places retained in the rounded off value should be the same as that of the specified value in the standard.

This standard BDS 512:YYYY Sauce (Fruits and Vegetables) (3rd Rev.) cancels and replaces BDS 512:2017 Sauce (Fruits and Vegetables) (2nd Rev.), which has been technically revised.

Bangladesh Standard Specification for Sauce (Fruits and Vegetables) (Third Revision)

1. Scope

- 1.1 This standard specifies the requirements and methods of test for Sauce (Fruits and Vegetables) for edible purposes.
- 1.2 This specification does not cover tomato ketchup, tomato paste, soy sauce and barbecue sauce.

2. Normative References

- 2.1 The relevant standards listed in Annex-A are necessary adjuncts to this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3. Terminology

- 3.1 **Sauce (Fruits and Vegetables)** means a culinary preparation used as an adjunct to food, prepared from the edible portion of any suitable fruit or vegetable (including roots, tubers, and rhizomes), their pulps/purees, or dried fruits, singly or in combination, and processed by blending with nutritive sweeteners, salt, spices, condiments, and other permitted edible ingredients appropriate to the product.

4. Ingredients

The following raw materials shall be used in the manufacture of sauce (fruits and vegetables):

- 4.1 The product shall be derived from any suitable kind and variety of fruit and/or vegetable which is wholesome and free from insect or fungal attack or blemish.
- 4.2 Fruit and Vegetable pulp/puree/juice or their concentration or dried fruits.
- 4.3 Sugar, spices, salt, citric acid, acetic acid.
- 4.4 Onion, garlic, ginger and any other permitted flavouring material.
- 4.5 **'Food Additives** – The product may contain any food additives as permitted under the food category 12.6 in the latest available version of Codex General Standard for Food additives (CODEX STAN 192)'.
(Note: The original text in the image contains a typo '12.6' which has been corrected to '12.6' based on the context of Codex standards.)
- 4.6 **Food Preservatives** – The product may contain only the following preservatives when tested according to the given methods in the table 1.

Table 1 Limit for preservatives

Sl.no. (1)	Preservatives (2)	Limit (3)	Method of test (4)
i.	Benzoic acid and/or its salts (as Benzoic acid), mg/kg, <i>Max.</i>	1000	BDS ISO 22855
ii.	Sorbic acid and/or its salts (as Sorbic acid), mg/kg, <i>Max.</i>	1000	BDS ISO 22855
iii.	Sulphur dioxide, Sulphites and/or its salts (as Sulphur dioxide), mg/kg, <i>Max.</i>	300	BDS ISO 5523
<p>NOTE – When more than one preservative is used, the amount of each shall be such that, when expressed as a percentage of the amount permitted singly, the sum of these percentages does not exceed one hundred percent.</p>			

4.7 Thickening agent - The product may contain thickening agents such as modified starches (as per GMP) and xanthan gum (maximum 0.5%), which must be declared on the product label.

5. Requirements

5.1 The product shall be free from pest, insects and their residues, rodent hair, adulterants, foreign matter, visible fungal infestation and other signs of spoilage.

5.2 The product shall also comply with the specific requirements given in Table 2, 3 and 4.

Table 2 Requirements for Sauce (Fruits and Vegetables)

Sl. No. (1)	Characteristics (2)	Requirement (3)				Method of Test (4)
		Chilli sauce	Fruits/Vegetables Sauces	Culinary paste/sauce	Ginger paste/sauce	
i)	Total soluble solids (Salt free basis), percent by mass, <i>Min.</i>	8.0	15.0	8.0	3.0	Annex B/ BDS ISO 2173/ AOAC 932.12
ii)	PH, <i>Max.</i>	4.6				BDS ISO 1842

Table 3 Maximum Limit for Heavy metals

Sl. No. (1)	Characteristics (2)	Limit (3)	Method of test (4)
i)	Arsenic (As), mg/kg, <i>Max.</i>	0.2	AOAC 986.15
ii)	Lead (Pb), mg/kg, <i>Max.</i>	0.3	AOAC 999.10
iii)	Copper (Cu), mg/kg, <i>Max.</i>	5.0	AOAC 990.10
iv)	Zinc (Zn), mg/kg, <i>Max.</i>	5.0	AOAC 986.15
v)	Tin (Sn), mg/kg, <i>Max.</i>	250.0	AOAC 980.19

Table 4 Maximum Limit for Microbiological Parameters

Sl. No. (1)	Characteristics (2)	Limit (3)	Method of test (4)
i)	Total Plate Count, cfu/g, <i>Max.</i>	50	BDS ISO 4833-1
ii)	Yeast and Mould count, cfu/g, <i>Max.</i>	<10	BDS ISO 21527-1
iii)	Total Coliform count, cfu/g, <i>Max.</i>	Nil	BDS ISO 4832
iv)	<i>Salmonella</i> /25g, <i>Max.</i>	Absent	BDS ISO 6579-1

5.3 The container shall be well filled with the product and shall occupy not less than 90.0 percent of the water capacity of the container when packed in rigid containers. The water capacity of the container is defined as the volume of distilled water at 20 °C that the sealed container is capable of holding when completely filled.

5.4 Hygiene – During processing, handling, storage and transportation, effective measures must be taken to prevent cross contamination with chemicals, microbial or physical contaminants.

5.4.1 The product shall be processed and packed under strict hygienic conditions in premises maintained in accordance with BDS 822.

5.5 Pesticide residues – The product covered by this standard shall comply with the maximum residue limits for pesticide established by the Codex Alimentarius Commission.

5.6 Legal Requirement – The product shall in all other aspects comply with the requirements of the legislations enforced in the country.

6. Packing and Marking

6.1 Packing – The material shall be packaged in containers made from food grade packaging material and sealed in a manner that will safeguard the hygienic, nutritional and organoleptic properties of the product throughout the shelf life of the product.

6.2 Marking – Each package shall be suitably labeled so as to give the following information:

- a) Name of the product as "X - sauce" or "X - mixed sauce", where 'X' denotes the common name of the fruit/vegetables/roots/tubers/ rhizomes used for making the product;

In the case of products manufactured from two or more fruits/vegetables, the product name shall include the names of the fruit/vegetable ingredient comprising the mixture in descending order of proportion by mass (m/m) or the words, "mixed fruit/vegetable sauce".

- b) Brand name or trade mark, if any;
- c) List of the ingredients including allergen if applicable;
- d) Name and address of the manufacturer/importer;
- e) Batch or code number;
- f) Net content in g;
- g) Date of manufacture and expiry;
- h) Maximum retail price (MRP);
- i) Country of origin, in case of imported products; and
- j) Any other requirements as specified under the 'Packaged Commodities Rules, 2021 (Amendment-2025)' of BSTI.

6.2.1 Each package may also be marked with the BSTI Certification Mark.

NOTE – The use of BSTI Certification Mark is governed by the provisions of Bangladesh Standards and Testing Institution Act, 2018 and the Rules and Regulations made thereunder. Details of conditions, under which a license for the use of BSTI Certification Mark may be granted to manufacturers or processors, may be obtained from the Bangladesh Standards and Testing Institution.

7. Sampling

7.1 Representative samples shall be prepared as prescribed in col. 3 of BDS 1010.

8. Tests

8.1 Test shall be carried out as prescribed in the relevant column of Table 1, 2, 3 and 4.

8.2 Quality of Reagents – Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (BDS 833) shall be used where the use of water as a reagent is intended.

NOTE – 'Pure chemicals' shall mean chemicals that do not contain impurities, which may affect the result of analysis.

9. Compliance

9.1 When on testing, each of the samples is found to conform to the requirements specified in this Bangladesh Standard Specification, the lot, batch or consignment from which the samples have been drawn shall be deemed to comply with standard specification.

Annex - A
[Clause 2.1]

List of Relevant Standards

BDS and ISO No.	Title
BDS 103	Methods of rounding off numerical value
BDS 822	Code of hygienic conditions for food processing units
BDS 833	Water for laboratory use
BDS 1010	Methods of sampling and test for processed fruits and vegetables in cans/containers
ISO 750:1998	Fruit and vegetable products — Determination of titratable acidity
BDS ISO 1842	Fruit and vegetable products - Determination of pH
BDS ISO 4832	Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of coliforms- colony count technique
BDS ISO 4833-1	Microbiology of food chain – Horizontal method for the enumeration of microorganism – Part 1: Colony count at 30°C by the pour plate technique
BDS ISO 5523	Liquid fruit and vegetable products – Determination of sulphur dioxide content (Routine method)
BDS ISO 6579-1	Microbiology of the food chain - Horizontal method for the detection, enumeration and serotyping of <i>Salmonella</i> – Part 1: Detection of <i>Salmonella</i> spp
BDS ISO 21527-1	Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of yeasts and moulds- Part 1: Colony count technique in products with water activity greater than 0.95
BDS ISO 22855	Fruit and vegetable products - Determination of benzoic acid and sorbic acid concentrations - High performance liquid chromatography method

For Public Comments Only

Annex B
Determination of Soluble Solids Content
(Exclusive of Salt)
[Table 2, Item (i)]

B-0 General

B-0.1 The total soluble solids are determined by subtracting the percent by mass of insoluble solids from percent by mass of total solids.

B-1 Determination of Total Solids

B-1.1 Apparatus

B-1.1.1 Flat-bottom dishes

B-1.1.2 Vacuum Oven

B-1.2 Procedure – Weigh accurately into a large flat bottom dish a portion of sample of so such size sample that the dry residue will not be less than 3 to 4 g of dry material. Distribute thinly in an even layer oven bottom of dish, diluting with water if necessary to facilitate distribution. Dry at 70 °C in a vacuum oven under pressure not exceeding 100 mm of mercury until consecutive weighings made at 2-hour intervals do not vary by more than 3 mg.

B-1.3 Calculation – From the loss in mass observed, calculate the percent by mass of total solids.

B-2 Determination of Insoluble Solids

A-2.1 Wash 20 g of sample repeatedly with hot water, centrifuging after each addition of water and pouring the clear, supernatant liquid through weighed filter or Buchner funnel. (The filter used is one of two such papers dried 2 hours at 100 °C and weighed in a covered dish. The second paper is used, if necessary, when first paper becomes clogged). After 4 or 5 washings, transfer remaining insoluble matter to filter, dry in a covered dish for 2 hours at 100 °C. Cool in desiccators and weigh.

B-2.2 Determination of Soluble Solids

B-2.2.1 The total soluble solids, percent by mass will be the difference between per cent total solids less the percent insoluble solids.

B-2.3 Determination of Percentage of Soluble Solids

B-2.3.1 Percentage of total soluble solids (exclusive of salt) may then be estimated by subtracting the percentage of insoluble solids and salt present in the sample is 1.5 per cent of the value obtained for total soluble solids.