SRI LANKA STANDARD 1188 : 1999

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SPECIFICATION FOR
BAKER'S YEAST

SRI LANKA STANDARDS INSTITUTION

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SLS 1188 : 1999

Gr. 8

SRI LANKA STANDARD INSTITUTION
17, Victoria Place,
Elvitigala Mawatha,
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Sri Lanka.

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
SPECIFICATION FOR BAKER'S YEAST

FOREWORD

This standard was approved by the Sectoral Committee on Agriculture and Food Products and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 1999-01-14.

Baker's yeast is used for the leavening of baked goods. It consists of *Saccharomyces cerevisiae* and related species. In the trade, it is available either in the compressed form or in the dried form.

During the formulation of this specification due consideration has been given to the relevant provisions made under the Sri Lanka Food Act No. 26 of 1980. Specific requirements given in this specification wherever applicable, are in accordance with the relevant regulations. However, general provisions made under the Sri Lanka Food Act, have not been included in this specification and therefore, the attention of the user of this specification is drawn to these general provisions.

Guidelines for the detemination of a compliance of a lot with the requirements of this standard based on statistical sampling and inspection are given in Appendix **A.**

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 an analysis, shall be rounded off in accordance with **CS 102**. The number of significant figures to be retained in the rounded off value shall be same as that of the specified value in this standard.

In the preparation of this specification, the assistance derived from the following publication is gratefully acknowledged :

IS 1320 : 1988 Indian standard specification for baker's yeast

1 SCOPE

This specification prescribes the requirements and the methods of test for baker's yeast.

2 REFERENCES

CS 102 Presentation of numerical values.
SLS 143 Code of practice for general principles of food hygiene
SLS 428 Random sampling methods.
SLS 467 Code of practice for labelling of prepackaged foods.
SLS 516 Microbiological test methods

3 TYPES

Bakers yeast shall be of the following two types :
a) Baker's yeast, compressed (BYC) ; and
b) Baker's yeast, dried (BYD).

4 REQUIREMENTS

4.1 Hygienic requirements

The product shall be manufactured in premises maintained under hygienic conditions as prescribed in **SLS 143.**

4.2 General requirements

4.2.1 *Baker's yeast, compressed*

4.2.1.1 Appearance

The product shall be in the form of a block having a creamy white colour. The product shall be free from mould and shall not show any signs of deterioration or decomposition.

4.2.1.2 Odour

The product shall have a characteristic odour of good baker's yeast (compressed).

4.2.1.3 Texture

The product shall have a fine even texture. It shall break sharply on bending.

4.2.1.4 Freedom from extraneous matter.

The product shall be free from extraneous matter.

4.2.1.5 Starch of an edible quality may be added in a quantity not exceeding 7 percent by mass on dry basis. Permitted edible binders and fillers may be added.

4.2.2 *Bakers yeast, dried*

4.2.2.1 Appearance

The product shall be in the form of powder, small granules, pellets or flakes.

4.2.2.2 Odour

The product shall have a characteristic odour of good bakers yeast (dried).

4.2.2.3 Texture

The product shall have a fine even texture.

4.2.2.4 The product shall not be mouldy and shall not show any signs of deterioration or decomposition.

4.2.2.5 The product shall be free from adulterants and other extraneous matter.

4.2.2.6 Starch of an edible quality may be added in a quantity not exceeding 10 per cent by mass of the product on dry basis.

4.3 Other requirements

The product shall comply with the requirements given in Table **1** when tested in accordance with the methods prescribed in Column 5 of the Table.

TABLE 1 - Requirements for baker's yeast

Sl. No.	Characteristics	Requirement		Method of test
		Baker's yeast compressed	Baker's yeast dried	
(1)	(2)	(3)	(4)	(5)
(i)	Moisture, per cent by mass, max,	73	8	Appendix **B**
(ii)	Dispersibility in water	To satisfy the test	To satisfy the test	Appendix **C**
(iii)	Fermenting power, min	1000	350	Appendix **D**
(iv)	Dough - raising capacity	To satisfy the test	To satisfy the test	Appendix **F**

4.4 Microbiological limits

The product shall comply with the requirements given in Table 2 when tested in accordance with the methods prescribed in column 5 of the table.

TABLE - 2 Microbiological Limits

Sl. No.	Test Organism	Limit		Method of test
		Baker's yeast compressed	Baker's yeast dried	
(1)	(2)	(3)	(4)	(5)
(i)	Bacterial flora, other than yeast, per gram (on dry basis;,max.	7.5×10^5	8.0×10^6	Appendix E
(ii)	*Coliform* per g max.	10	50	SLS 516 Part 3 & Appendix E
(iii)	*E, coli*	Absent in 1.0g	Absent in 1.0 g	SLS 516 Part 3 & Appendix E
(iv)	*Salmonella*	Absent in 25g	Absent in 25 g	SLS 516 Part 5 & Appendix E

5 PACKAGING AND MARKING

5.1 Packaging

5.1.1 *Baker's yeast, compressed*

The fresh yeast blocks shall be wrapped or packed in a clean waxed paper or in any other suitable food grade wrapping material or non-toxic wrapper to preserve freshness and to prevent undue deterioration during storage. The yeast blocks shall be stored at temperature between 1 ^{o}C to 5 ^{o}C.

5.1.2 *Baker's yeast, dried*

The dried yeast shall be packed in a clean, air-tight container, preferably a tin to prevent the absorption of moisture and undue deterioration during storage. The yeast shall be stored in a cool and dry place at a temperature of not more than 25 ^{o}C.

5.2 MARKING

5.2.1 The following information shall be marked legibly and indelibly on each package :

a) Name and type of the product ;
b) Brand name or trade name ;
c) Net mass in gram or killogram ;
d) Name and address of manufacturer ;
e) Batch or code number ;
f) Declaration ‘contains added starch’, if starch is added;
g) The information regarding storage of product ;
h) Date of manufacture ; and
j) Date of expiry.

5.2.2 General guidelines for marking and labelling as given in **SLS 467** shall be followed**.**

NOTE

Attention is drawn to certification marking facilities offered by Sri Lanka Standards Institution. See the inside back cover of this standard.

6 METHOD OF TEST

Tests shall be carried out as prescribed in the relevant Appendices of this standard, SLS 516 Part 3 and SLS 516 Part 5.

APPPENDIX A
COMPLIANCE OF A LOT

The sampling scheme given in this Appendix should be applied where compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assured based on manufacturers control systems coupled with type testing and check tests or any other procedure, appropriate schemes of sampling and inspection should be adopted.

A.1 LOT

In any consignment all packages/containers of baker’s yeast of same type and size belonging to one batch of manufacture or supply shall constitute a lot.

A.2 GENERAL REQUIREMENTS OF SAMPLING

In drawing, preparation, storing and handling of samples the following precautions shall be observed.

A.2.1 Samples shall be drawn in an environment not exposed to damp air, dust or soot.

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

A.2.3 The samples shall be placed in clean, dry glass or any other suitable container. The sample containers shall be sealed air-tight after filling and shall be marked with necessary details of sampling.

A.2.4 The product being sampled, the samples, the sampling instrument and the sample containers shall be protected from adventitious contamination.

A.2.5 Samples shall be stored, so that the conditions of storage do not affect the quality of the product.

A.3 SCALE OF SAMPLING

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

A.3.2 The number of packages/containers to be selected from the lot shall be in accordance with the Table **3.**

TABLE 3 - Scale of sampling

Number of packages/containers in the lot (1)	Number packages/containers to be selected (2)
Up to 150	5
151 to 280	6
281 to 500	8
501 and above	10

A.3.3 The packages/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 NUMBER OF TESTS

A.4.1 Each package/container selected as in **A.3.2** shall be inspected for packaging and marking requirements.

A.4.2 Each package/container inspected as in **A.4.1** shall be opened and individually inspected for the requirements given in **4.2** except **4.2.1.5** & **4.2.2.6**.

A.4.3 A composite sample shall be prepared by taking sufficient quantities of material from each package/container inspected as in **A.4.2** and tested for the requirements given in **4.3.**

A.4.4 Each package/container selected as in A.3.2 shall be individually inspected for the requirements given in **4.4.**

A.5 CRITERIA FOR CONFORMITY

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

A.5.1 Each package/container inspected as in **A.4.1** and **A.4.2** satisfies the relevant requirements.

A.5.2 The test results on composite sample tested as in **A.4.3** satisfy the relevant requirements.

A.5.3 Each package/container tested as in A.4.4 satisfy the relevant requirements.

APPENDIX B
DETERMINATION OF MOISTURE

B.1 REAGENT

B.1.1 Ethyl alcohol 95% (v/v) or rectified spirit

B.2 APPARATUS

B.2.1 Dish - with a cover, made of aluminium; about 25 mm in height and 75 mm in diameter

B.2.2 Glass stirring rod ; approximately 60 mm long, with a flattended end

B.3 PROCEDURE

B.3.1 Weigh the dish with the cover and stirring rod. Transfer to the dish about 10g of the dried yeast or 2.5 g of the compressed yeast and weigh accurately to the nearest milligram. Remove the cover of the dish and add 5 ml of alcohol. Mix throughly by means of the stirring rod and allow the stirring rod to remain in the weighing dish. Dry at **105 ± 1°C** for 4 h ± 2 minutes for compressed yeast and 360 ± 2 minutes for dried yeast. Cool the dish in a dessicater and weigh.

B.4 CALCULATION

B.4.1 Moisture, per cent by mass = $\frac{100 \times (M_1 - M_2)}{M_1 - M}$

where,

M is the mass, in g, of the dish ;
M_1 is the mass, in g, of the dish with the material before drying ; and
M_2 is the mass, in g, of the dish with the material after drying.

APPENDIX C
TEST FOR DISPERSIBILITY IN WATER

C.1 PROCEDURE

C.1.1 Weigh about 5g of dried yeast or 20 g of compressed yeast in a 400-ml beaker. Add 50 ml of distilled water at 40 ^{0}C . Leave the product undisturbed for 5 minutes. Stir for 2 minutes. Take 900 ml of distilled water at 40 ^{0}C into a one litre graduated cylinder in the case of dried yeast and 30 ^{o}C or ambient temperature in the case of compressed yeat. Pour the slurry from the beaker to the water in graduated cylinder. Wash the beaker with 50 ml of water and transfer the same to the cylinder and leave it for 5 minutes to find out whether any deposits are appearing. If deposits do not settle, the material shall be considered to have passed the test.

NOTE

In the case of dried yeast, however, the added starch may form a sediment which may contain a few yeast cells.

APPENDIX D
DETERMINATION OF FERMENTING POWER

D.1 REAGENTS

D.1.1 Sugar phosphate mixture
Grind and mix thoroughly 400 g of sucrose, 25 g of diammonimum hydrogen phosphate [$(NH_4)_2 HPO_4$] and 25 g of dipotassium hydrogen phosphate ($K_2 HPO_4$).

D.1.2 Calcium sulphate solution
Dilute 30 g of saturated solution of calcium sulphate ($CaSO_4 2H_2O$)with 70 g of water.

D.1.3 Composition of manometer solution
Weigh 200 g of anhydrous calcium chloride and 10 g of cupric chloride and dissolve in distilled water. Add a little of hydrochloric acid so that the final pH after making up solution to 2 litres does not exceed 5.0.

D.2 APPARATUS

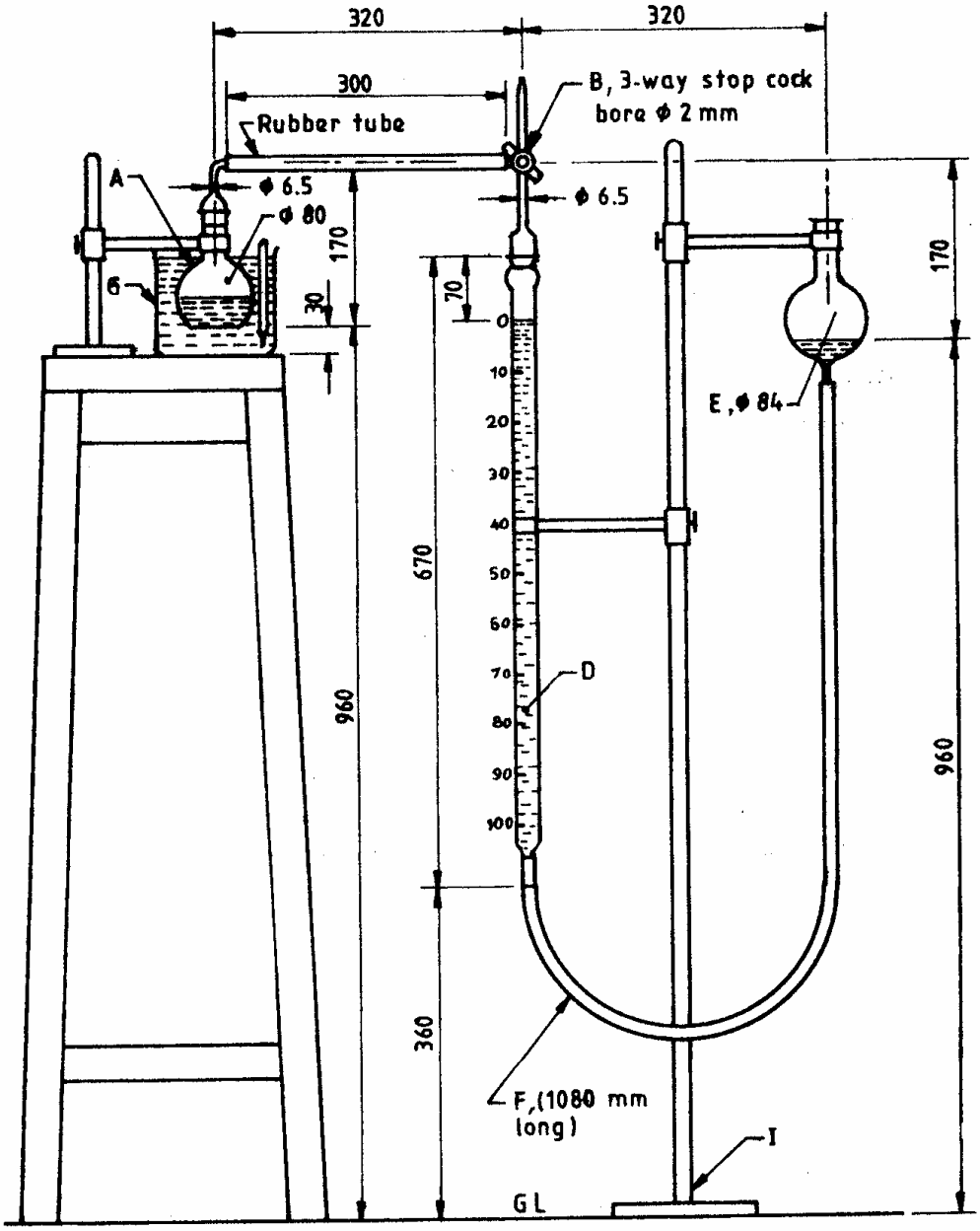
D.2.1 The assembly of the apparatus is illustrated in **Fig. 1.** It consists of a flat-bottomed flask [A] of 250 ml capacity, its mouth fitted with ground-glass joint having glass delivery tube bent at right angle. It is connected to the three-way shaped stop-cock [B] which in turn is fitted on the 100-ml graduated tube [D]of the manometer. [E] is the monometer reservoir of 250-ml capacity. [I] is the iron stand. D and E are connected with PVC tube [F]. [G] is the water-bath.

D.2.2 Barometer

D.2.3 Thermometer

D.3 PROCEDURE

D.3.1 Dissolve 6.75 g of the sugar phosphate mixture in 75 ml of the calcium sulphate solution in the flask. Add 3.57 g of compressed yeast or 0.893 g of dried yeast. Stir well to disperse the material. Keep the flask in the water bath at 30 ^{0}C throughout the experiment. The threeway stop cock of the manometer is then brought to a position which shall allow the displacement of initial air (by the carbon dioxide evolved) to escape to the atmosphere without displacement of manometer fluid. This displacement is allowed for the first 13 minutes after which the stop-cock position is altered so as to allow the carbon dioxide evolved to enter the manometer and bring about the displacement of the manometer fluid. Shake the contents of the flask every 10 minutes.



Dimensions in millimetres

FIGURE 1 – Fermentometer apparatus

D.3.2 While taking the reading of the gas evolved, the level of the fluid in the manometer shall be adjusted by sliding the reservoir arm of the manometer and the volume of gas evolved at this pressure (which will now be equal to the atmospheric presssure) to be recorded.

D.3.3 As soon as the reading is taken, the initial gas formed, which has just been measured is allowed to escape into the atmosphere by operating the threeway stop-cock and the stop-cock position is again adjusted to take the second reading. For compressed yeast, readings are taken every 10 minutes and for dried yeast, half-hourly readings are taken. In both cases, readings are taken for 3 hours.

D.3.4 The room temperature and the atmosphereic pressure is also noted during the course of the experiment. The readings are recorded in a tabulated form (see Table **4**) and the total volume of gas produced is calculated and corrected at NTP, that is, at 101 Kpa pressure and 20 ^{0}C temperature by the formula given in **D.4.1.1**

D.4 CALCULATION

D.4.1 fermenting power (corrected volume in ml) $= \dfrac{\text{Observed volume x observed average pressure x 293}}{\text{760 x (273 + Room temperature*)}}$

* Average room temperature

TABLE 4 : Proforma for recording Carbon dioxide (CO_2)evolved every 10 minutes / 30 minutes (clause D.3.4)

Time **(1)**	**Volume of CO_2 evolved ml (2)**	**Room temperature ^{0}C (3)**	**Atomospheric pressure mm Hg (4)**	**Corrected volume ml (5)**
10.00 hrs	----------	----------	----------	----------
10.10 hrs	----------	----------	----------	----------
10.20 hrs	----------	----------	----------	----------
10.40 hrs	----------	----------	----------	----------

13.00 hrs	----------	----------	----------	----------
	Total volume	Average temperature	Average pressure	

D.4.1.1 The mass of carbon dioxide evolved may be calculated from this corrected volume, by the following formula :

$$\text{Mass of carbon dioxide evolved} = \frac{44 \times v}{22400} \text{ g}$$

where,

v is the corrected volume in ml of carbon dioxide evolved**.**

APPENDIX E
DETERMINATION OF BACTERIAL FLORA OTHER THAN YEAST

E.1 GENERAL

E.1.1 All precautions shall be taken while opening the container throughout the test, to prevent bacterial contamination.

E.1.2 Two methods for determining bacterial flora other than yeast are given. Method 1 is given under **E.2** and Method 2 under E.3. Any of the two methods may be used.

E.1.3 Preparation of sample

Preenrichment of sample - Inplace of standard Buffered peptone water use, nutrient broth and inplace of 0.1 percent peptone diluent use, ringer solution.

E.2 METHOD 1

E.2.1 Reagents

E.2.1.1 Citric acid solution, sterile
Prepare an approximately 10 per cent (v/v) solution of citric acid in water and sterilize in an autoclave at 121 ^{0}C for 15 minutes.

E.2.1.2 Dextrose agar medium, having the following composition.

Peptone	20 g
Dextrose	40 g
Agar	25 g
Water, distilled	1 000 ml

E.2.1.2a Preparation - Steam the ingredients to dissolve. Sterilize in an autoclave at 121 ^{0}C for 15 minutes. Adjust to pH 3.5 $\pm$. 1 with the sterile citric acid solution **(E.2.1.1).**

E.2.1.3 Nutrient agar medium, having the following composition ;

Beef extract	3 g
Peptone	5 g
Agar	25 g
Water, distilled	1 000 ml

E.2.1.3 a Preparation
Steam the ingredients to dissolve. Adjust to pH to 6.8 $\pm$ .2. Sterilize in an autoclave at 121 ^{0}C for 15 minutes.

E.2.1.4 Ringer's solution stock solution (full strength), having the following composition ;

Sodium chloride (NaCl)	9.0 g
Potassium chloride (KCl)	0.42 g
Calcium chloride ($CaCl_2$)	0.24 g
Sodium bicarbonate ($NaHCO_3$)	0.20 g
Water, distilled	1000 ml

E.2.1.4 a preparation
Dissolve the ingredients and sterilize in an autoclave at 121 ^{0}C for 15 minutes.

E.2.1.4. b Dilute the Ringer's solution to four times with sterile distilled water before use.

E.2.2 Apparatus

Refer SLS 516 Part 1 clause 5.

E.2.3 Procedure for determining "Yeast cell count"

E.2.3.1 Preparation of Sample
Weigh 10 $\pm$ .1g of sample aseptically into a sterile container. Add 90ml dialuant (E.2.1.4) and homogenize 10 $^{-1}$ dialution. Transfer 1 ml of the initial suspensions (10^{-1}) into a tube containing 9 ml of the sterile dialuant. mix well either by shaking 25 times in a 30 cm arc or in a mechanical mixer to obtain 10^{-2} dialution. Repeat the operation using 10^{-2} and further dialutions to obtain as many dialution as are necessary to produce acceptable counts (between 15 300 colonies) at two sucessive dialution (refer to 516 Part 1 clauses 7.2 & 8).

E.2.3.2 Preparation of further decimal dialution

E.2.3.2.1 Procedure
Refer SLS 516 Part 1 clause 9. Use dextrose ager medium (E.2.1.2) maintain at 45 $\pm$ 1^{o}C as the growth medium. (Avoid prolong heating of the medium inorder to avoid hydrolysis of medium.

E.2.3.3 *Incubation*
Incubate the petri dishes in the inverted position at 30 $\pm$ 1 ^{0}C for 72 $\pm$ 3 hours.

E.2.3.4 *Counting*
Count the yeast colonies with the aid of magnification under uniform and properly controlled illumination. Count only those plates with 30 to 300 colonies. Refer SLS 516 Part 1 clause **11.1.1**

E.2.4 Procedure for Determining Plate Count

E.2.4.1 Refer E.2.3.1 & E.2.3.2 instead of Dextrose media use nutrient medium (**E.2.1.3)**

E.2.4.2 *Incubation*
Refer E.2.3.3.

E.2.4.3 *Counting*
Refer SLS 516 Part 1 Count the number of colonies with the aid of magnification under uniform and properly controlled illumination. Count only those plates with 30 to 300 colonies.

E.2.5 Calculation & expression of results

E.2.5.1 *Calculation for "yeast cell count"*

E.2.5.2 Complete the average yeast cell count per gram from the dilutions used.

E.2.5.3 Yeast cell count per gram (on drybasis), $y_c = \frac{100 \times C_w}{100 - M}$

where,

C_w is the yeast cell count per gram ; and

M is the moisture, per cent by mass, as determined in Appendix **B**

E.2.5.4 *Calculation for bacterial flora, other than yeast*

E.2.5.4.1 Complete the average plate count per gram from the dilution used.

E.2.5.4.2 Plate count, per gram (on dry basis), $T_c = \frac{100 \times T_w}{100 - M}$

where,

T_w is the average plate count per gram ; and

M is the moisture per cent by mass as determined in Appendix **B**

E.2.5.4.3 Baclerial flora, other than yeast count per gram (on dry basis) = $T_c - y_c$

E.3 METHOD 2

E.3.1 Principle
The growth of yeast cells are inhibited by additions of antimicrobials such as nystatin or cycloheximide (actidione) and the material in a suitable medium is incubated at 37 $\pm$ 1 ^{0}C for 48 $\pm$ 2 hours. The bacterial flora other than yeast is then counted.

E.3.2 Regents

E.3.2.1 Nystatin or Cycloheximide (Actidione) solution, 0.22 per cent (m/v). Sterilized at 35 kPa for 20 minutes.

E.3.2.2 *Yeast suspension (m/m) basis* - dilution 10^{-2} to 10^{-6}

E.3.2.3 *Nutrient agar and yeast extract medium*

E.3.2.3a *Nutrient agar*

Bacto beef extract	3.0 g
Bacto peptone	5.0 g
Sodium chloride	8.0 g
Bacto agar	15.0 g
Distilled water	1000 ml
pH	7.0

E.3.2.4 Suspend nutrient agar in water and add 10g of yeast extract. Heat in a boiling water bath to dissolve. Dispense in suitable containers (12 ml) while hot into test tubes and cover. Sterilize by autoclaving at 121^{o}C for 15 minutes.

E.3.3 APPARATUS
Refer SLS 516 Part 1 clause 5

E.3.4 Preparation of samples & further decimal dialution
Refer **E.2.3.1** & **E.2.3.2**

E.3.4.1 Procedure

Refer SLS 516 Part 1 clause 9 & use nutriant agar medium
Melt the nutriant agar mediam (E.3.2.3) to 46 $\pm$ 1^{o}C and pour sterile nystatin or cycloheximide solution so as to give a final concentration of 0.12% (v/v).

Refer SLS 516 Part 1 clause 11.1.1

E.3.4.2 *Incubation*
Incubate the petri dishes inverted position at 30 $\pm$ 1^{o}C for 48 $\pm$ 2 hours.

E.3.5 Calculation & Expression of Results

$$\text{Bacterial flora other than yeast, per gram (on dry basis)} = \frac{100 \times N}{100 - M}$$

where,

N is the count, per gram, of bacterial flora other than yeast ; and
(Refer SLS 516 Part 1 clause 11.1.1)

M is the moisture, per cent by mass, as determined in Appendix **B**.

E.4 Enumeration of *Coliforms & E coli*

E.4.1 Proceed as SLS 516 Part 3 clause 7 using quarter strength Ringer's solution as dialuant. Incubate at 30 $\pm$ 1^{o}C for 48 $\pm$ 2 hours for coliforms.

E.4.2 Detection of Salmonellae
Proceed as SLS 516 part 5. Use nutriant broth of compositing given below as the preenrichment media. (Nutrient Broth - Mix and disslove by heating 10 g peptone, 10 g meat extract and 5 g sodium chloride in 1000 ml water. when cool adjust pH to 7.5 to 7.6 remove precipitate by filtration through filter paper sterilize by autoclaving at 120^{o}C for 15 minutes.

APPENDIX F
DETERMINATION OF DOUGH -RAISING CAPACITY

F.1 MATERIAL

F.1.1 *Wheat flour* - conforming to **CS 144 : 1972** with minimum 2 per cent maltose.

F.1.2 *Sucrose*

F.2 PROCEDURE

F.2.1 Weigh 4.000 g of baker's yeast (compressed) or 1.000 g of baker's yeast (dried) with 100 g of wheat flour. Add 1.0 g to 1.5 g of sucrose and a suitable quantity of water (about 55 ml is required). Knead well. Press the resulting dough into a glass beaker. Note the level of the dough by means of a scale, from the bottom of the beaker. Keep covered for one hour at 27 ^{0}C. At the end of this period, note the level again.

F.2.2 The material shall be deemed to have satisfied the test, if the rise in level is at least 80 per cent of the original for dried yeast and 110 percent for compressed yeast.

SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

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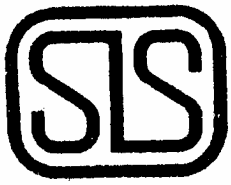

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