DRAFT TANZANIA STANDARD

Alcohol/Brewer's Yeast- Specification

TANZANIA BUREAU OF STANDARDS

Tanzania Bureau of Standards

P O Box 9524

Dar es Salaam

Tel +255 (22) 2450206/2450949/2450298

Fax: +255 22 2450298

E-mail: info@tbs.go.tz

Contents

Page

National Foreword

This Tanzania Standard was published under the authority of the Board of Director of Tanzania Bureau of Standards.

Tanzania Bureau of Standards (TBS) is the statutory national standards body for Tanzania established under the Standards Act No. 3 of 1975, which was amended by Act No. 1 of 1977 and subsequently repealed and replaced by the Standards Act No. 2 of 2009.

Tanzania Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. The Technical Committees work under the supervision of Divisional (sectoral) Committees. The Standards are developed and finalized in accordance with the Guide and Procedure for Development of Standards.

Tanzania Standards are subject to review, to keep pace with technological advances. Users of the Tanzania Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

This Tanzania Standard was developed under the supervision of the Agriculture and Food Divisional Standards Committee (AFDC). The Technical Committee responsible for the standard is Food Additives Technical Committee (AFDC05).

The reporting of the result of a test or analysis made in accordance to this Tanzania Standard, if the final value, observed or calculated is to be rounded off, shall be done in accordance with TZS 4 (see Clause 2).

Introduction

Alcohol/Brewer's yeast (*Saccharomyces spp*) is an essential microorganism used in the brewing industry for the fermentation of sugars into alcohol and carbon dioxide, which are crucial to beer production and other alcoholic products. Beyond its primary role in brewing and other alcoholic beverage production, it is widely utilized in the food, feed, pharmaceutical, and biotechnology industries. As a by-product of beer production and other alcoholic products, it serves as a rich source of protein, B-complex vitamins, and minerals, and its components such as β-glucans and mannan oligosaccharides have functional and nutritional benefits.

In industrial applications, alcohol/brewer's yeast is used to formulate animal feed supplements**,** nutraceuticals, and probiotic products, and also as a fermentation agent in biotechnological processes, including enzyme and recombinant protein production. Its versatility and nutritional value make it an economically significant ingredient across multiple sectors, promoting sustainable use of brewing by-products and contributing to environmental management by reducing industrial waste.

Ensuring the quality and safety of alcohol/brewer's yeast is vital to maintain product consistency, consumer confidence, and regulatory compliance. National bodies establish standards that define its composition, purity, microbial quality, and processing requirements. Adherence to these standards guarantees that alcohol/brewer's yeast products meet defined specifications, supporting industrial efficiency, food safety, and global trade reliability.

Alcohol/Brewer's Yeast - Specification

1 Scope

This draft Tanzania Standard specifies requirements, sampling and test methods for alcohol/brewer's yeast (*Saccharomyces spp*) intended for brewing and production of other alcoholic products. .

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. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

TZS 109, *Hygiene in the food and drink manufacturing industry — Code of practice*

TZS 122-2, Microbiology of food and animal feed - Horizontal method for the detection, enumeration and serotyping of Salmonella - Part 2: Enumeration by a miniaturized most probable number technique

TZS 125-1, Microbiology of the food chain - Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) - Part 1: Method using Baird-Parker agar medium

TZS 538, Labeling of pre-packaged food – Requirements

TZS 729, Microbiology of food and animal feeding stuffs -Horizontal method for the enumeration of coliforms - Colony count technique

TZS 731, Microbiology of food and feeding-stuffs - Horizontal method for the detection and enumeration of presumptive Escherichia Coli - Most Probable Number Technique

TZS 963-1, Starch and derived products – Heavy metals content – Part 1 – Determination of arsenic content by atomic absorption spectrometry

TZS 963-3, Starch and derived products – Heavy metals content – Part 3 – Determination of lead content by atomic absorption spectrometry with electro-thermal atomization

TZS 1509, Milk based infant formula – Determination of thiamine content by fluorometric method

TZS 1567-3, Determination of vitamins in flours- Part 3: Determination of riboflavin (vitamin B2) content in fortified flours - high performance liquid chromatography method

TZS 1993, Infant formula and adult nutritionals — Methods of tests — Determination of vitamin B3 (Niacin) by high performance liquid chromatography (HPLC)

TZS 2932, Food and feed products — General guidelines for the determination of nitrogen by the Kjeldahl method

TZS 4718, Cereals and cereal products - Determination of moisture content - Part 1: Reference method

3 Terms and definitions

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

3.1
alcohol/brewer's yeast
yeast species (typically *Saccharomyces cerevisiae*) that is used or suitable for production of beer and other alcoholic products.

3.2
extraneous matter
all organic and inorganic material other than alcohol/brewer' yeast

3.3
food grade material
material, made of substances that are safe and suitable for their intended use and which will not impart any toxic substance or undesirable odour or flavour to the product.

3.4
food grade packaging material
material which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product

4 Requirements

4.1 General Requirements

Alcohol/brewer's yeast shall;

(i) be in the form of a granular powder or in form of a creamy liquid texture

(ii) be of characteristic colour, typically ivory, cream or brownish

(iii) have a characteristic taste and odour of good quality yeast and be free from any unpleasant musty or putrid smell.

(iv) be free from rodent contamination, visible mould growth and insect infestation.

(v) be free from extraneous matter, added colour and deleterious substances.

NOTE - The appearance, taste and odour of alcohol/brewer's yeast shall be determined by organoleptic tests.

4.2 Specific Requirements

Alcohol/brewer's yeast shall comply with the specific requirements given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Specific Requirements for alcohol/brewer's yeast

S/N	Characteristic	Creamy Liquid Form	Granular Powder Form	Test method
i.	Moisture content, max., % m/m	85	9.0	TZS 4718
ii.	Crude protein, (N*6.25), min. % m/m	40.0		TZS 2932
iii.	Viability	To pass test		Annex A
iv.	Starch	To pass test		Annex B
v.	Niacin, mg/100 g, Min	30		TZS 1993
vi.	Riboflavin, mg/100 g, Min	4		TZS 1567-3
vii.	Thiamine, mg/ 100 g, Min	10		TZS 1509

5. Hygiene

5.1 Alcohol/Brewer's yeast shall be produced, processed, packed, stored, transported and handled under good hygienic conditions in accordance with TZS 109 to prevent contamination that may be harmful to consumer.

5.2 Alcohol/brewer's yeast shall comply with the microbiological limits given in Table 2, when tested in accordance with the test methods specified therein

Table 2 — Microbiological limits for alcohol/brewer's yeast

S/N	Characteristic	Limits		Test Method
		Creamy Liquid Form	Granular Form	
(i)	Coliform count, cfu/g, max	50	10^2	TZS 729
(ii)	*Escherichia coli*, MPN/g	Absent		TZS 731
(iii)	*Salmonella* in 25 g	Absent		TZS 122-2
(iv)	*Staphylococcus aureus,* cfu/g, max.	10		TZS 125-1

6. Contaminants

Heavy metal contaminants

Alcohol/ Brewer's Yeast shall not contain any heavy metal and other contaminants in excess of the quantities specified in Table 3.

Table 3 — Maximum limits of heavy metals contaminants of alcohol/brewer's yeast

S/No.	Contaminants	Maximum limits (mg/kg)	Test method
i	Arsenic (As)	2.0	TZS 963-1
ii	Lead (Pb)	1.0	TZS 963-3

7. Packaging

Alcohol/Brewer's yeast shall be securely packaged in containers made of food grade packaging materials. The packages shall preserve the safety and quality of the product, prevent entry of light and preclude contamination from the external environment.

8. Labelling

8.1 In addition to the labelling requirements of TZS 538, the packages shall be legibly and indelibly labelled with the following information:

a) name of the product., "Alcohol/Brewer's Yeast";

b) name and physical address of the processor/packer/importer;

c) date of manufacture;

d) expiry date;

e) net weight of the product in metric units;

f) list of ingredients in descending order by quantity when used; and

g) instructions for use

8.2 Labelling of non-retail containers

Information detailed in 8.1 shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the processor or packer as well as storage instructions, shall appear on the container.

However, lot identification and the name and address of the processor or packer may be replaced by an identification mark provided that such a mark is clearly identifiable with the accompanying documents.

9. Sampling

Representative samples for the products shall be drawn in accordance with Annex C.

Annex A
(normative)

Determination of Viability

A.1 General

A-1 REAGENT

A-1.1 Yeast Nutrient Mixture - Grind and mix thoroughly 4 g of sucrose, 0.50 g of di-ammonium phosphate, 0.25 g of magnesium sulphate and 0.5 percent yeast extract.

A-2. PROCEDURE

A-2.1 Add 4.5 g of yeast nutrient mixture to a 100 ml Pasteur flask containing 50 ml of tap water and sterilize by heating in an autoclave for 20 minutes at 115°C.

A-2.2 Cool to 28°C, add with aseptic precautions 2 g of sample and incubate at 28°C.

A-2.3 Collect the gas evolved with a graduated tube inverted over the outlet tube in a trough of water and measure the volume of gas at the end of 6 hours.

A-2.4 Repeat the operation omitting the sample and subtract the volume of gas evolved from that obtained in the first determination.

A-2.5 The sample shall be considered to have passed the test if the difference is not greater than 10 ml. If the difference is more than 10 add 0.05 ml of 0.1% of methylene blue solution to 0.05 ml of a 1.0 percent suspension in water, allow to settle for 5-10mins, thus examine under the microscope.

A-2.6 Observe the slide under microscope, count the number of stained (dead) and unstained (live) cells in several field of view. Calculate the percentage of live cells using the formula;

Viability % = Number of live cells / Total number of cells *100

A-2.6The sample shall be considered to have passed the test if viability is not less than 70% .

Annex B
(informative)

Determination of Starch

B.1 REAGENT

B.1.1 Iodine Solution

B.2 PROCEDURE

B-2.1 Take some granular powder of alcohol/brewer's yeast in a test tube and add iodine solution to it.

B-2.2 No blue color should be produced indicating the absence of starch.

Annex C
(informative)

Sampling of Alcohol/Brewer's Yeast

C-I. GENERAL REQUIREMENTS OF SAMPLING

C-1.0 In drawing, preparing, storing and handling sample, the following precautions and directions shall be observed.

C-I.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

C-1.2 The sampling instrument shall be clean and dry.

C-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the container for samples, from adventitious contamination.

C-I.4 Samples shall be placed in clean and dry glass containers. The sample containers shall be of such a size that they are almost completely filled by the sample.

C-I.5 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment.

C-I.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

C-2. SCALE OF SAMPLING

C-2.1 Sampling of Drums (Bulk Packing)

C-2.1.1 Lot - All the drums in a single consignment belonging to the same batch of manufacture shall constitute a lot.

C-2.1.2 For ascertaining the conformity of the material to the requirement of this specification, samples shall be tested from each lot separately.

C-2.1.3 The number of drums to be selected from the lot shall depend on the size of the lot and shall be in accordance with Table 2.

C-2.2 Sampling of Bags (Consumer Packing)

C-2.2.1 Lot - All the bags in a single consignment belonging to the same batch of manufacture shall constitute a lot.

C-2.2.2 For ascertaining the conformity of the material to the requirements of this specification, samples shall be tested from each lot separately.

Table 1 - Scale of sampling for Drums (Clause C-2.2.3)

Number of Drums in the Lot (1)	Sample Size (2)
Up to 25	2
26 - 50	3
51 to 100	5
101 and above	8

C-2.2.3 The number of bags to be selected from the lot shall depend on the size of the lot and shall be in accordance with Table 2.

Table 2 Scale of sampling for Bags

Number of Bags in the Lot (1)	Sample Size (2)
Up to 100	3
101 - 300	5
301 to 500	8
501 to 1000	13
1000 and above	20

C-2.3 These drums/bags shall be selected at random from the lot. C-2.3.1 If bags are packed in boxes, at least 20 percent of the boxes subject to a minimum of 2 shall be selected at random from the lot and equal number of bags shall be selected from each box so as to constitute the required sample size given in Table 2.

C-3. TEST SAMPLES AND REFEREE SAMPLES

C-3.1 From each drum/bag selected according to Table 1 and 2, draw with a suitable sample instrument a representative portion of material sufficient for carrying out triplicate tests for all the characteristics. Out of these portions a small but approximately equal quantity of material shall be taken and mixed thoroughly to form a composite sample. The composite samples shall be divided into three equal parts, one for the purchaser, another for the supplier and third to be used as a reference sample.

Each part shall be sufficient for tests required to be made on the composite sample (see C-4.2). Each of these parts of the composite sample shall be transferred to clean and dry containers made of glass and labelled with the particulars of sampling given in C-1.5.

C-3.2 The remaining portion of the material from each drum/bag shall be divided into three equal parts and transferred to thoroughly clean and dry containers, sealed air-tight and labelled with the particulars of sampling given in C-1.5. The material in each container shall constitute an individual sample. The individual

samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, another for the supplier and third for the referee.

C-3.3 The referee samples shall consist of a set of individual samples (C-3.2) and a composite sample (see C-3.1) shall bear the seals of the purchaser and the supplier. These shall be kept at a place agreed to between the purchaser and the supplier so as to be used in case of a dispute between the two.

C-4. NUMBER OF TESTS

C-4.1 Tests for protein and vitamins shall be conducted on each of the sample constituting a set of individual test samples (see C-3.2).

C-4.2 Tests for remaining requirements given in 2 of this specification shall be conducted on the composite sample (see C-3.1).

C-5. CRITERIA FOR CONFORMITY

C-5.1 The lot shall be considered to have met the requirements of protein and vitamins if each of the individual samples satisfies the corresponding specification requirements.

C-5.2 The lot shall be considered to be satisfactory in respect of the requirements tested on the composite samples if all the test results on the composite sample satisfy the corresponding specification requirements.

C-5.3 The lot shall be declared as conforming to the requirement of this specification if C-5.1 and C-5.2 are satisfied.

Bibliography

[1] IS 10759:1983 Brewer’s Yeast - Specification