AFDC 24(1199) DTZS

DRAFT TANZANIA STANDARDS

Ready-to-drink Coffee Beverage-Specification

TANZANIA BUREAU OF STANDARDS

0 Foreword

Ready to drink coffee beverages is a beverage prepared from coffee powder (instant/roasted and ground), coffee extract or coffee flavours and/or cane sugar, milk powder, creamer, potable water with or without food additives in the preference of the consumer.

production and importation into Tanzania of ready to drink coffee beverages has significantly increased following new innovation on product development. This Tanzania Standard has been developed in order to ensure wholesomeness, safety and quality of ready to drink coffee beverages.

In the preparation of this Tanzania Standard assistance was drawn from:

TZS 585: 2019, Ready to drink non-carbonated, Non-alcoholic beverage – Specification, published by the Tanzania Bureau of Standards

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

1. Scope

This Tanzania Standard specifies requirements, sampling and methods of test for ready–to-drink coffee beverage intended for direct human consumption.

2. Normative references

The following standard, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies

TZS 4, Rounding off numerical values

TZS 109: Code of hygiene for food processing units

TZS 115 Permissible food additives and levels of use schedule

TZS 114 Soft drink manufacturing un its – Code of hygiene

TZS 118 Microbiology – General guidance for the enumeration of microorganisms – Colony count technique
TZS 119 Microbiology – General guidance for the enumeration of conforms–Most probable number technique (MPN)

TZS 268 General atomic absorption spectrophotometric method for determination of lead in food stuffs

TZS 414: Instant (soluble) coffee powder – Specification

TZS 416: Instant coffee –Sampling method for bulk units with liners

TZS 417 Roasted and ground coffee – Specification

TZS 480 Coffee and coffee products - Determination of the caffeine content using High Performance Liquid Chromatography (HPLC) – Reference method

TZS 538 Labelling of pre-packaged foods — General requirements
TZS 831: Brown sugar- specification

TZS 789 Drinking water (potable) – The requirements for drinking water and bottled drinking water
TZS 2207 Milk powders and cream powder – Specification

TZS 2426-2: Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of yeasts and moulds - Part 2: Colony count technique in products with water activity less than or equal to 0.95

FTZS 2931-1 Methods for determination of organic preservative in foodstuffs-Part 1: Benzoic acid and its salts

FTZS 2931-3 Methods for determination of organic preservative in foodstuffs-Part 3: Sorbic acid and its salts

3. terms and definitions

for the purpose of this Tanzania Standard, the following definitions shall apply:

3.1 ready to drink coffee beverage

coffee processed and presented in the ready to drink form

3.2 Pasteurization

heat treatment that kills all pathogenic and majority of food spoilage micro-organisms present and usually involves the application of temperature below 100°C.

3.4 Sterilization

heat treatment that involves application of temperature above 100°C in which commercial sterility is achieved

3.5 Commercial sterility:

the condition achieved by application of heat (above 100°C) which renders such food free of viable forms of micro-organism having public health significance, as well as any micro-organisms of non-health significance capable of reproducing in the food under normal, non-refrigerated conditions of storage and distribution

4. Requirements

4.1 General requirements

Ready to drink coffee beverages shall be prepared from coffee extract or coffee flavours or coffee powder (instant/roasted and ground) and/or cane sugar, milk powder, creamer, potable water conforming to TZS 789 (see clause 2), with or without the addition of the following:

a) Acidity regulator; (sodium bicarbonate, citrus fiber, etc)

b) Permitted food conditioner excluding acidity regulator mentioned in 4.1.5;

c) Permitted flavouring substances;

d) Permitted preservatives;

e) Permitted colouring substances;

f) Permitted nutrient supplement like vitamin C;

g) Salt and

h) Permitted sweeteners.

Shall mean a product which can be consumed directly without any further treatment

4.1 Ingredients

Any of the following ingredients may be used in the manufacture of ready to drink coffee beverages:

4.1.1 coffee extracts

Shall be extracted from natural and properly roasted and ground coffee beans. They may either be freshly prepared or concentrated and preserved either by pasteurization or addition of permitted chemical preservatives.

4.1.2 coffee powder

shall be obtained from instant and/or roasted and ground coffee conforming to TZS 414 and TZS 417 respectively

4.1.3 cane sugar

Conforming to TZS 831

4.1.4 milk powder

Conforming to TZS 2207

4.1.5 portarble water

Conforming to TZS 789

4.1.6 Food additives:

Use of food additives shall be in accordance with CODEX STAN 192-1995

4.1.6.1 Flavour

sum of those characteristics of any material taken in the mouth, perceived principally by the senses of taste and smell, and also the general pain and tactile receptors in the mouth, as received and interpreted by the brain. The perception of flavour is a property of flavourings.

4.1.6.2 flavourings

Substances either naturally present in fruit/plant or added, capable of imparting flavour to the product and shall be safe for human consumption.

4.1.6.3 Nutritive and non-nutritive sweeteners

Nutritive and permitted non-nutritive sweeteners may be used.

4.1.6.4 Acidity regulator

The following acids and their sodium, potassium, calcium salt may be used in the manufacture of ready to drink coffee beverages:

a) Citric acid;

b) Lactic acid;

c) Malic acid;

d) Acetic acid;

e) Fumaric acid

f) Tartaric acid

Mineral acids other than phosphoric acid are not allowed to be used in the manufacture of ready to drink coffee beverages.

4.1.6.5 Permitted food colours

Permitted food colours currently allowed in CODEX STAN 192-1995

4.1.6.6 Permitted preservatives

Benzoic acid and/or sulphur dioxide and/or sorbic acid may be used to preserve ready to drink coffee beverages (see table 1).

The product on testing shall not contain more than the amounts permitted in table 1.

Table 1: Preservatives

Preservatives	Amount permitted (ppm), (max)	Method of test
Sulphur dioxide	350	Annex B
Benzoic acid	1000	FTZS 2931-1
Sorbic acid	500	FTZS 2931-3

4.1.7 Appearance

The product shall be free from insect, rodent contamination and foreign particles as well as visibly free from insoluble matters. The product shall possess a good body and uniform colour depending on the ingredients used apart from coffee powder.

4.1.8 Flavour and aroma

The product shall have flavour and aroma characteristic of the coffee, or coffee extracts or which it is claimed or implied. Off-flavours and -odours shall not be present.

4.2 Specific requirements

Chemical requirements for ready to drink coffee beverage shall be as provided in table 1.

Table: 1 chemical requirement for ready to drink coffee beverage

No	Characteristic	Requirements	Method of test refer TZS (see clause 2) and annexes
1.	pH	2.5-4.5	AOAC 970.21
2.	Caffeine, ppm, max (if used).	150	TZS 480
3.	Water soluble matter (on dry basis), % m/m	10	

5. Contaminants

5.1 Heavy Metal contaminants

The product on testing shall not contain metal contaminants more than the amounts given in table 2.

Table 2: Limits for metal contaminants

No.	Characteristic	Limits (ppm), (max)	Method of test
1	Arsenic,	0.1	Annex A
2.	Lead,	0.2	TZS 268

5.2 pesticides residues

Liquid concentrated coffee shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission online database.

5 Hygiene

5.1 The product shall be prepared under strict hygienic conditions according to TZS 114 and TZS 109 (see clause 2).

5.2 Microbiological requirement

The product on testing shall not contain microbiological count more than the amounts given in table 4.

Table 4: Microbiological limits

	Characteristics	Requirements	Methods of tests
	Total plate count CFU per mL, max	10^3	TZS 118
	yeasts and moulds, CFU)/mL, max	Absent	TZS 2426-2
	Coliform CFU/mL	absent	TZS 119

6 Sampling

Sampling shall be done in accordance with TZS 416

7.0 Packing, marking and labelling

7.1 Packing

Ready to drink liquid coffee beverage 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

7.2 Marking and labelling

7.2.1 In addition to the requirements given in this Tanzania Standard ready to drink coffee beverages shall also be parked, labelled and marked in accordance with the requirements prescribed in TZS 538: (see clause 2).

a) Name of the product such as: coffee drink;
b) Brand or trade name;
c) Name, postal and physical address of the manufacturer and/or packer;
d) Net volume in mL;
e) List of ingredients in descending order of proportions.
f) Code number indicating batch and/or date of manufacture and

g) Date of manufacture and 'best before' date.
h) Instruction for use and storage.
i) Instruction for disposal of used package

7.2.2 Each container may also be marked with the TBS Standards Mark of Quality.

NOTE: The use of the TBS certification mark is governed by the provision of the Standards Act, 2009. Details of the conditions under which a license for the use of TBS certification mark may be granted to the manufacturer may be obtained from TBS.

Annex A

Determination of arsenic

A.1 Apparatus

A.1.1 Atomic absorption spectrophotometer, with the following operating parameters:

A.1.1.1 For arsenic: wavelength at 193.7 nm, slit setting – 0.7 nm, light source-electrodeless discharge lamp or hollow cathode lamp, and flame type-air/acetylene, lean, blue.

The hydride generation apparatus includes a reaction flask, a reductant reservoir and all pneumatic components for controi of the carrier gas and transport of metallic vapours to the quartz cell.

A.1.2 Crucible

A.1.3 Electric hot plate

A.1.4 Muffle furnace, maintained at 500 °C.

A.1.5 Volumetric flask, 20 ml.

A.1.6 Whatman filter-paper, acid washed.

A.2 Reagents

A.2.1 Nitric acid, concentrated.

A.2.2 Nitric acid solution, 0.3 M. Dilute 19.6 ml concentrated nitric acid (A.2.1) to 1 litre with deionised water.

A.2.3 Nitric acid solution, 1.5 % v/v.

AE.2.4 Potassium hydroxide solution, 20 % w/v.

A.2.5 Sulphuric acid, 1 % v/v.

A.2.6 Sulphuric acid solution, 20 % v/v.

A.2.7 Hydrochloric acid, concentrated (P_{20}= 1.18 g/ml).

A.2.8 Hydrochloric acid solution, 1.5 % v/v.

E.2.9 Hydrochloric acid solution, 3 % v/v.

A.2.10 Hydrochloric acid soiution. 5 % v/v.

A.2.11 Hydrochloric acid solution, (1+1).

A.2.12 Potassium permanganate solution, 5 % v/v.

A.2.13 Boric acid solution, saturated (approx- 50 g/l).

A.2.14 Magnesium nitrate hexahydrate [Mg $(N0_3)_2$,$6H_2O$] solution, 50% w/v.

A.2.15 Arsenic standard solutions.

A.2.15.1 *Stock solution*

Containing 1,000 µg As/ml. Dissolve 1,320 g arsenic trioxide AS_2O_3 in 25 ml 20% w/v potassium hydroxide solution (A.2.4). Neutralise with 20% v/v sulphuric acid solution (A.2.6) with phenolphthalein as indicator. Make up to one litre with 1 % v/v sulphuric acid solution (A.2.5). Commercial arsenic standard solution may also be used.

A.2.15.2 *Working standard solutions*

1 µg, As/ml (in 1.5 % v/v hydrochloric acid solution) [A.2.8].

For calibration, use 10 µl, 25 µl and 50 µl aliquots corresponding to 10 ng, 25 ng and 50 ng As, respectively.

A.2.16 Reductant

3 % w/v sodium borohydride solution in 1 % w/v sodium hydroxide solution. Solution should be prepared fresh and filtered before use.

A.3 Procedure

A.3.1 Sample preparation

A.3.1.1 Measure accurately about 100 ml sample onto a porcelain crucible. Evaporate to dryness in a water-bath. Char the sample by heating over a low bunsen burner flame. Continue heating until charring is complete.

E.3.1.2 Place the crucible containing pre-ashed sample in a muffle furnace (A.1.4) and ash at 500 °C for 2 hours. Cool and wet the ash with 0.5 ml concentrated nitric acid (A.2.1). Heat the crucible on a hot plate (A.1.3) until no more fumes is given off and return to the furnace (A.1.4). Repeat the wetting procedure, if necessary, until the ash is white.

A.3.1**.3** After ashing, carefully dissolve the residue using 2 ml concentrated nitric acid

(A.2.1) and then with 4 ml 0.3 N nitric acid solution (A.2.2). Filter through acid washed filterpaper (A.1.6) into a 20 ml volumetric flask (A.1.5). Wash the residue twice and dilute the filtrate to volume with deionised water.

A.3.1.4 Dilute the above solution with deionised water to place the concentration of arsenic in a suitable range, if necessary.

A.3.2 Analysis

A.3.2.1 Dispense 10 µl arsenic working standard solution (A.2.15) into a reaction flask (A.1.1). Make up the volume to 10 ml with 1.5 % v/v hydrochloric acid solution (A.2.8).

A.3.2.2 Connect the flask to the hydride generation apparatus (A.1.1). Push down and hold the plunger for 10 sec to dispense the reductant (A.2.16) into the sample solution. Record the maximum reading of the absorbance. Remove the reaction flask.

A.3.2.3 Repeat the procedures in A.3.2.1 and A.3.2.2 using 25 µl and 50 µl arsenic working standard solution (A.2.15.2) for calibration purposes.

A.3.2.4 Transfer appropriate volume of the sample solution into a reaction flask (A.1.1). Make up the volume to 10 ml with 1.5 % v/v hydrochloric acid solution (A.2.8).

A.3.2.5 Proceed as in A.3.2.2.

Annex B

Determination of sulphur dioxide

B.1 Apparatus

B.1.1 The apparatus shall be set up as follows:

Connect a round-bottomed flask of 1000 ml to 1500 ml capacity to a water-cooled reflux condenser, whose upper end is connected with two absorption tubes in series. Connect an inlet gas tube to the flask which will nearly reach the bottom of the flask. The other end of this inlet tube is connected to a bottle containing sodium carbonate solution. Each absorption tube contains hydrogen peroxide neutralised with 0.1 M sodium hydroxide using bromophenol blue solution as indicator.

B.2 Reagents

B.2.1 Hydrochloric acid, sp. gr. 1.18 at 20 °C

B.2.2 Nitrogen, from a cylinder

B.2.3 Hydrogen peroxide solution, 6 %v/v and neutralize with 0.1M sodium hydroxide using bromophenol blue solution as indicator.

B.2.4 Bromophenol blue solution,

Dissolve 0.1 g of bromophenol blue in 3.0 ml of 0.05 M sodium hydroxide. Add 5 ml of ethanol (90 % v/v) after the solution is affected. Add sufficient ethanol (20 % v/v) to produce 250ml.

B.2.5 Sodium carbonate solution, 10 % w/v

B.2.6 Sodium hydroxide, 1.0 M standard volumetric solution.

B.3 Procedure

B.3.1 Introduce 500 ml of water and 20 ml of hydrochloric acid into the flask. Connect the flask with the condenser and absorption tubes. Pass through the apparatus a steady flow of nitrogen which has been bubbled through sodium carbonate solution. Gradually heat the liquid until it boils. Allow to boil for about 10 min. Cool the flask by gradual immersion in water.

B.3.2 Weigh 200 g or a suitable quantity of the sample and transfer quantitatively into the flask. Heat gently in a stream of nitrogen and boil for one hour. Turn off the nitrogen, disconnect the absorption tubes and titrate the contents with 0.1 M sodium hydroxide.

B.3.3 Carry out a blank determination leaving out the sample but adding all the reagents.

B.4 Calculation

B.4.1 Sulphur dioxide, ppm

$$= \frac{32{,}000(V_1 - V_2)\,N}{W}$$

Where,

V_1 is the volume of 0.1 M sodium hydroxide required for sample, in ml

V_2 is the volume of 0.1 M sodium hydroxide required for blank, in ml; N is the normality of sodium hydroxide; W is the weight of sample, in g.