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**DRAFT TANZANIA STANDARD**

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**Ready to drink non-carbonated non-alcoholic beverage –  
Specification**

FOR STAKEHOLDERS' COMMENTS ONLY

## **0 FOREWORD**

Importation and production of ready to drink non-alcoholic non-carbonated beverages have significantly increased following trade liberalization.

This Tanzania Standard has been developed in order to ensure, safety and quality of ready to drink non-alcoholic non-carbonated beverages.

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

TZS 585:2011 Ready to drink non-carbonated non-alcoholic beverage – Specification

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, methods of sampling and test for ready to drink non alcoholic non carbonated beverages intended for direct human consumption.

This Tanzania Standard excludes mineral water, soya bean milk drinks, milk and milk shake, energy drinks, fruit squashes, carbonated soft drinks, coffee, tea, chicory, cocoa and their related products.

## **2 NOMATIVE REFERENCE**

The following referenced documents are indispensable for the application of this standard. 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 59, Water – Distilled quality – Specification*

*TZS 100 Plantation sugar-specification*

*TZS 101, Refined sugar – Specification*

*TZS 109, Code of hygiene for food processing units*

*TZS 114, Soft drink manufacturing units – 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 coliforms – Most probable number technique (MPN)*

*TZS 131, Microbiology – General guidance for enumeration of yeast and mould – Colony count technique at 25 °C*

*TZS 132, Edible common salt – Specification*

*TZS 163, Fresh fruits and vegetable products – Methods of sampling*

*Codex Stan 192, General standard for food additives*

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

*TZS 538/EAS 38 - Labelling of pre-packaged foods — General requirements*

*TZS 789, Drinking water (potable) – The requirements for drinking water and bottled drinking water*

*TZS 851 Honey – specification*

*TZS 1491, Fruits and vegetables - Determination of pH*

*TZS 1496, Fruits, vegetables and derived products – Determination of soluble solids*

*TZS 1497:2015/ ISO 5523-1981 Fruits, vegetables and derived products -Sampling and methods of test - Part 11: Liquid fruit and vegetable products - Determination of Sulphur dioxide content (routine method)*

*TZS 1498:2015/ ISO 6557/2-1984 Fruits, vegetables and derived products -Sampling and methods of test - Part 12: Determination of ascorbic acid content - Routine method*

*TZS 1502 - Fruits and Vegetables – Determination of Arsenic content*

*TZS 1581-1, Determination of cadmium content – Method graphite furnace atomic absorption spectrometry*

### **3 TERMS AND DEFINITIONS**

For the purpose of this Tanzania Standard, the following terms and definitions shall apply:

3.1 ready to drink non-carbonated non alcoholic beverage

a non-alcoholic and non-carbonated beverage prepared from comminuted fruit, fruit juices, concentrates, natural flavours and/or fruit or plant extracts, concentrated syrup containing sugar or any other nutritive sweeteners, potable water conforming to TZS 789 (see clause 2), with or without the addition of the following ingredients:

- a) Acidity regulator;
- b) Permitted food conditioner
- c) Permitted flavouring substances;
- d) Permitted preservatives;
- e) Permitted colouring substances;
- f) Permitted nutrient supplement like vitamin C;
- g) Salt

3.2 ready to drink beverage

shall mean a product prepared as per clause 3.1 after which it can be consumed directly without any further treatment.

3.3 pasteurization

heat treatment that kills all pathogenic and majority of food spoilage micro-organisms present

and usually involves the application of specific temperature and time.

#### 3.4 sterilization

heat treatment that involves application of specific temperature and time in which commercial sterility is achieved.

#### 3.5 straight chilling

drinks preserved and served without any water, ice, or other mixer

#### 3.6 commercial sterility:

the condition achieved by application of heat 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

##### 4.1.1 Ingredients

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

##### 4.1.1.1 *Comminuted fruit/vegetable and fruit/vegetable juices or concentrates*

Extracted from natural and properly washed fruits/vegetables and fit for human consumption. They may either be freshly prepared or concentrated and preserved either by pasteurization or addition of permitted chemical preservatives.

##### 4.1.1.2 *Essential oils and fruit/vegetable extracts*

Essential oils and fruit/vegetable extracts are compounds obtained from fruit or vegetable and shall be safe for human consumption.

##### 4.1.2 Appearance

The product shall be free from insect, rodent contamination and foreign particles as well as visibly free from seeds and skins. The product shall possess a good body and uniform colour.

##### 4.1.3 Flavour and aroma

The product shall have flavour and aroma characteristic of the fruits, vegetables or flavours of which it is claimed or implied. Foreign flavours and odours shall not be present.

##### 4.1.4 Fruit content

4.1.4.1 Ready to drink non-carbonated non-alcoholic beverage shall be considered as Fruit flavoured drink when fruit juice content is less than 10%.

4.1.4.2 Ready to drink non-carbonated non-alcoholic beverage shall be considered as Fruit drink when contain fruit juice content 10-25%.

4.1.4.3 Ready to drink non-carbonated non-alcoholic beverage shall be considered as Fruit juice drink when contain fruit juice content greater than 25%.

#### 4.2 Specific requirements

Physical and chemical requirements for ready to drink non carbonated non alcoholic

beverage shall be as provided in Table 1.

**Table 1: Physical and chemical requirements for ready to drink non carbonated non alcoholic beverages.**

No	Characteristic	Requirement	Method of test refer TZS (see clause 2) and annexes
1.	Degrees brix at 20 °C, <i>min</i>	10	TZS 1496
2.	pH	2.5 - 4.5	TZS 1491
3.	Vitamin C mg/100 ml, <i>min</i>	35	TZS 1498
4.	Caffeine, ppm, max (if used).	150	Annex A
5.	Quinine, ppm, (if used).	40-85	Annex B

### 4.3 Food additives

Food additives shall be used in accordance with Codex Stan 192.

4.3.1 Sweetening agent shall be of the following types;

#### i) Nutritive sweeteners

Sugar used in the manufacture of non-carbonated non-alcoholic beverages shall conform to TZS 101 (see clause 2). Invert sugar shall have been prepared from sucrose complying with the requirements given in TZS 100 (see clause 2). Honey if used shall also comply with TZS 851. Use of any other nutritive sweeteners shall comply with the relevant Tanzania Standards.

#### ii) Non-nutritive sweeteners

Non-nutritive sweeteners shall be used only in low-calorie (diet) non-carbonated non-alcoholic beverages in accordance with Codex Stan 192. If used in dietetic (low calorie) non-carbonated non-alcoholic beverages shall be declared on the label.

**Note: The use of both nutritive sweeteners and non-nutritive sweeteners (blending) in the same product is prohibited**

## 5 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	Maximum Limits	Method of test(Annex)
1	Cadmium , ppm,	0.003	TZS 1581-1
2	Arsenic, ppm,	0.1	TZS 1502
3	Lead, ppm,	0.1	TZS 268

## 6 HYGIENE

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

### 6.2 Microbiological requirement

The product on testing shall not contain microbiological count more than the amounts given in Table 3.

**Table 3: Microbiological limits**

Characteristics	Requirements			Methods of tests (see clause 2)
	Straights chilling	Sterilized	Pasteurized	
Total colony count (cfu) per ml, max	1 x 10 <sup>2</sup>	Absent	10	TZS 118
Viable yeasts and moulds, (cfu)/ml, max	10	10 (Cross check with references)	10(Cross check with references)	TZS 131
Presumptive Coliform organisms, MPN/ml	Absent	Absent	Absent	TZS 119

## 7 SAMPLING AND TESTS

### 7.1 Sampling

For the purpose of this standard sampling of guava juice shall be done in accordance with TZS 163 (see clause 2)

### 7.2 Methods of test

The methods of test shall be as given in tables 1, 2, 3, and 4 and carried out as detailed in annexes A to B.

## 8 PACKING, MARKING AND LABELLING

### 8.1 Packing

8.1.1 Ready to drink beverage shall be packed in suitable food grade containers having no action on the product. The containers shall be free from contaminants or foreign matters that may alter the safety and quality requirements of the product.

Containers shall be airtight and shall be provided with tamper proof seals and closures. Containers shall preclude contamination with or proliferation of microorganisms in the product during storage and transportation.

**8.1.2** The head space of each container shall be 10% of the fill.

## **8.2 Marking and labelling**

**8.2.1** In addition to TZS 538, each container shall be suitably marked or labeled with the following information.

- a) Name of the product such as "Orange flavoured drink/; Orange drink/Orange juice drink"
- b) Brand or trade name;
- c) Name, postal and physical address of the manufacturer and/or packer;
- d) Net volume;
- e) List of ingredients in descending order of proportions.
- f) Batch number
- g) Date of manufacture and 'expiry date
- h) Instruction for use and storage.
- i) Declaration of the use of non-nutritive sweeteners in the case of dietetic (low calorie) drinks

**8.2.2** Misrepresentation of ready to drink beverage through fruit pictorial or claims such "as fruit drink on the label is prohibited, a claim 'fruit drink' is allowed if a minimum of 10 percent of the fruit portion is from natural fruit juice produced in accordance to good manufacturing practice. Use of fruit pictorial is only allowed if a minimum of 25 percent of the fruit portion is from natural fruit juice produced in accordance to good manufacturing practice.

**8.2.2.1** Other claims such as "fruit juice drink may only be applied on the label if the drink contains a minimum of 25 percent of the fruit portion. In both cases (8.2.2 and 8.2.2.1)) use of claims such as "healthy drink "is prohibited.

**8.2.3** The language on the label shall be "Kiswahili" and/or English. A second language may be used depending on the designated market."

**8.2.4** 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. 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**

## Annex A

### Determination of caffeine

#### A.1 Preparation of sample

##### A.1.1 Carbonated beverages

Decarbonate by agitation or ultrasonic treatment. If free of particulate matter, inject directly.

##### A.1.2 Beverages containing particulate matter

Filter through millipore filter (0.45 µ) discarding the first few and filtrate. Inject filtrate directly.

#### A.2 Sample

A.2.1 Weigh accurately 2 g – 5 g sample (depending on the expected caffeine content).

A.2.2 Transfer into 250 ml round bottom flask.

A.2.3 Reflux with 100 ml 10 HCl for 1 hour.

A.2.4 Transfer contents of flask into 200 ml volumetric flask with 50 ml of deionised water.

A.2.5 Basify with 25 ml of NH<sub>4</sub>OH (50 % v/v).

A.2.6 Make up to the mark with deionised water.

A.2.7 Filter through refilter and micro filter.

#### A.3 Standard caffeine (100 ppm)

A.3.1 Weigh accurately 0.0100 g of caffeine.

A.3.2 Dissolve in 30 ml deionised water.

A.3.3 Basify with 5 ml of NH<sub>4</sub>OH (50).

A.3.4 Make up to 100 ml with deionised water.

#### A.4 HPLC apparatus

A.4.1 Column for HPLC, type C<sub>18</sub>, with spherical particles.

A.4.2 Ultraviolet detector

A.4.3 Chart recorder

#### A.5 HPLC conditions

A.5.1 Solvent (mobile phase): 25 % CH<sub>3</sub>OH (methanol)  
75 acetic acid (1 % v/v)

A.5.2 Wavelength 280 nm



**A.5.3** Flowrate                      0.9 ml/min

**A.5.4** Chart speed                      0.2 cm/min

**A.5.5** Sensitivity                      0.1 AUFS

**A.5.6** Injection volume              10  $\mu$ l

### **A.6 Calculation**

Caffeine in sample (%w/w)

$$= \frac{A_{\text{sample}}}{A_{\text{standard}}} \times \frac{C}{W} \times V \times 10^6 \times \frac{100}{(100 - M)} \times 100$$

Where

$A_{\text{sample}}$  is the peak area for sample;  
 $A_{\text{standard}}$  is the peak area for standard;  
 $C$  is the concentration of caffeine standard (ppm);  
 $V$  is the total volume of sample;  
 $W$  is the weight of sample (g);  
 $M$  is the moisture of sample (%)

## Annex B

### Determination of quinine

#### B.1 Apparatus

**B.1.1** Spectrophotometer, capable of measuring absorption at 347.5 nm.

#### B.2 Procedure

##### B.2.1 Degassing carbonated beverage

If the beverage is carbonated chill before opening. Pour it back and forth several times between two large beakers to remove CO<sub>2</sub> before proceeding with the analysis.

**B.2.2** Pipette 50 ml of degassed liquid into a 100 ml volumetric flask. Add 20 ml of 0.5 M HCl and bring to mark with water. Mix and determine absorption at 347.5 nm using a 1 cm path length cell. Determine mg of quinine present corresponding to the observed optical density by reference to a standard graph.

##### B.2.3 Preparation of standard graph

Weigh accurately 100 mg of reagent grade quinine (dried for 3 hours at 100°C) into a 100 ml volumetric flask, dissolve in 20 ml of 0.5 M HCl, bring to mark and mix (1 ml = 1.0 mg quinine alkaloid). Transfer separately 0.5, 1.0, 2.0, 3.0, 4.0, 5.0 and 6.0 ml into seven 100 ml volumetric flasks and proceed as above, beginning. "Add 20 ml 0.5 M HCl and bring to mark....." Plot absorbance against mg quinine on semi-log paper. A straight line should result.

The usual concentration of quinine in commercial beverages is up to 120 ppm (6 mg/50 ml), so this procedure should accommodate all commercial carbonated beverages. The standard graph should be established by the analyst for the equipment and reagent used. It should then be checked periodically.