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DRAFT TANZANIA STANDARD

Edible Maize (corn) Starch - Specification

TANZANIA BUREAU OF STANDARDS

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0. Foreword

Edible Maize starch also known as corn starch, maize starch, or corn flour is the starch derived from maize grain (*Zea mays* Linn) kernel endosperm. Corn starch is a common food ingredient, often used to thicken sauces or soups, and to make corn syrup and other sugars.

This Tanzania Standard has been developed to keep up with advancements of the food industry and to ensure the safety and quality of the product traded in the markets in order to safeguard the health of the consumers.

In preparation of this Tanzania standard assistance is derived from the following publications;

1) IS 1005, Edible maize (corn) starch — Specification KS 340: 2007, Edible maize starch — Specification
2) RS 25:2020, Edible maize starch - Specification

In reporting the result of a test or analysis made in accordance with the 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)

Edible maize (corn) starch—Specification

1. Scope

This Draft Tanzania Standard specifies the requirements, sampling and test methods for edible maize starch derived from maize grain (*Zea mays* Linn) commonly referred to as edible corn starch intended for human consumption.

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, Food Processing unit – Code of Hygiene

TZS 330, Cereal and Pulses – Sampling

TZS 331, Cereals and Pulses – Test methods

TZS 438, Maize grain - Specification

TZS 538, *General standard for the labelling of pre-packaged foods*

TZS 799, Foodstuffs — Determination of aflatoxin B1, and the total content of aflatoxins B1, B2, G1 and G2 in cereals, nuts and derived products — High-performance liquid chromatographic method Specifies a reverse-phase high-performance liquid chromatographic method, with immunoaffinity column clean-up and post-column derivatization, for the determination of aflatoxins in cereals,

TZS 118, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1: Colony count at 30 degrees C by the pour plate technique*

TZS 122, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Salmonella spp.*

TZS 131, *Microbiology of food and animal feeding stuff – General guidance for enumeration of yeasts and moulds – Colony count technique at 25oC*

TZS 538/EAS 38; *Labelling of pre-packaged foods — Specification*

TZS 730-2*, Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia coli — Part 2: Colony-count technique at 44 degrees C using 5- bromo-4-chloro-3-indolyl beta-D-glucuronide*

TZS 125-1*, Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

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

TZS 963 (Part 4), Starch and derived products – Heavy metals content – Part 4 – Determination of cadmium content by atomic absorption spectrometry with electro-thermal atomization

3. Terms and definitions

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

3.1 starch

is a carbohydrate polymer made by linking of glucose units end to end into very long chains

3.2
edible maize starch (edible corn starch)

product obtained from maize kernel endosperm (*Zea mays* Linn) manufactured by the wet or dry milling process.

3.3 wet milling process

milling operation which is primarily performed by steeping maize kernels in aqueous solution for the purpose of the isolation andrecovery of starch

3.4 dry milling process

the commination of maize kernels in suitable mills without the presence of liquid to produce maize flour.

3.5 food grade packaging material

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

4.0 Requirements

4.1 Raw materials

Maize grains complying with TZS 438

4.2 General requirements

Edible maize (corn) starch shall:

(i) be in the form of a fine powder;

(ii) be white in colour, except when prepared from yellow maize in which case it may be light creamy;

(iii) be free of rancidity, adulterants, insect or fungus infestation, and from fermented musty or other objectionable odours;

(iv) not contain added sweetening, flavouring, colouring agents or any foreign matter; and

(v) be free from dirt and other suspended and extraneous matter.

4.3 Specific requirements

Edible maize(corn) starch shall also comply with the requirements given in Table 1 when tested in accordance with test methods therein.

Table 1 —Specific requirements for edible maize (corn) starch

S/N.	Characteristic	Requirement	Test method
i.	Moisture, % m/m, max	12.5	TZS 331
ii.	Total ash %m/m, max	0.2	
iii.	Acid-insoluble ash , % by m/m, max	0.10	
iv.	Starch content on dry basis, % m/m, min	98.0	
v.	Protein content on dry basis, % (m/m), max	0.6	
vi.	Fat content on dry basis ,% (m/m), max	0.15	
vii.	pH of aqueous extract	4.5 - 7	
viii	Alcoholic acidity (esprelted at H.SO,) with 90 percent alcohol % by mass max,	0.025	
ix	Sulphur dioxide SO_2 , max, mg/kg	50	ISO 5379

4.4 Microscopic appearance and granule size

When Edible maize (corn) starch is subjected to microscopic examination, the granules shall conform to the following description:

(i) Maize starch granules should be polygonal or rounded in shape and appear to be quite uniform in size;

(ii) the longest axis ranges from 10 µm to 30 µm (0.01 mm to 0.03 mm); and

(iii) the hilum shall be fairly marked and starred with fissures but no striae shall be observed; distinct polarized crosses shall, however, be seen.

4.5 Particle size

Particle size for edible maize (corn) starch shall not be more than 2 % by mass of the material that is retained on a 75-µm sieve and not more than 0.5 % by mass that is retained on a 150-µm sieve.

5.0 Contaminants

5.1 Heavy metals

Edible maize (corn) starch shall comply with those limits for heavy metals in Table 2 when tested in accordance withtest methods specified therein

Table 2 — Limits for heavy metal contaminants

S/N	Heavy metal	Maximum limit, *mg/kg*	Test method
i.	*Lead (Pb)*	0 .2	TZS 963 (Part 3)
ii.	*Cadmium*	0.1	TZS 963 (Part 4)

5.2 Mycotoxins

Edible maize (corn) starch shall comply with those maximum levels of mycotoxins specified in the table 3 whentested in accordance with test methods specified therein.

Table 3 — Maximum limits for mycotoxins

S/N	Mycotoxins	Requirement, *µg/kg, max*	Test method
i.	*Total Aflatoxin*	10	*TZS 799* *TZS 331*
ii.	*Aflatoxin B1*	5	
iii.	*Fumonisin*	2000	

5.3 Pesticide residues

Edible maize (corn) starch shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

6.0 Hygiene

6.1 Edible maize (corn) starch shall be produced, prepared and handled in accordance with TZS 109

6.2 Edible maize (corn) starch shall not exceed microbiological limits given in Table 3 when tested in accordancewith the test methods specified therein.

Table 3 — Microbiological limits for edible maize (corn) starch

S/N	Microorganisms	Maximum limit	Test method
i.	*Total viable count, cfu/ g, max.*	10^4	TZS 118
ii.	*E. coli, cfu/g .*	Absent	TZS730-2
iii.	*Salmonella spp, per 25 g,.*	Absent	TZS 122
iv.	*Staphylococcus aureus, cfu/g .*	Absent	TZS 125-1
v.	*Yeasts and moulds , cfu/g, max.*	10^3	TZS 131

7.0 Packaging, marking and labelling

7.1 Packaging

Edible maize (corn) starch shall be packaged in suitable food grade packaging materials.

7.2 Labelling

7.2.1 In addition to the requirements in TZS 538, each package shall be legibly and indelibly marked with the following:

a) name of the product as “Edible maize starch/ Edible corn starch”;

b) name, location and physical address of the manufacturer;

c) net content;

g) batch number;

h) country of origin;

i) date of manufacture;

j) expiry date;

d) instructions for use; and

m) storage conditions.

n) Declarations of allergens

7.2.2 The language on the label shall be “Kiswahili”, ‘English ‘or both. A second language may be used depending on the designated market.

7.2.3 The packages of the capsules may also be marked with the TBS Standards Mark of Quality

NOTE — The TBS Standards Mark of Quality may be used by the manufacturers only under licence from TBS. Particulars of conditions under which the licences are granted, may be obtained from TBS.

8.0 Sampling

Sampling of edible maize starch shall be done in accordance with TZS 330