Fried potato chips — Specification
Compliance with this standard does not, of itself confer immunity from legal obligations

A Uganda Standard does not purport to include all necessary provisions of a contract. Users are responsible for its correct application
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Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Tourism, Trade and Industry established under Cap 327, of the Laws of Uganda. UNBS is mandated to co-ordinate the elaboration of standards and is

(a) a member of International Organisation for Standardisation (ISO) and

(b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and

(c) the National Enquiry Point on TBT/SPS Agreements of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of representatives of consumers, traders, academicians, manufacturers, government and other stakeholders.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

Committee membership

The following organisations were represented on the Sugars, edible starches and related confectionery standards sub-committee (TC 2-SC 11) under the supervision of Technical Committee for Food and Agriculture standards, UNBS/TC 2, during the development of this standard:

- Africa 2000 Network, Uganda
- Consumer Education Trust (CONSENT)
- Kachwekano Zonal Agricultural Research and Development Institute (KAZARDI)
- Ministry of Agriculture, Animal Industries and Fisheries (MAAIF)
- Mukono Zonal Agricultural Research and Development Institute (MUZARDI),
- Nyabyumba United Farmers Ltd
- Tomcris Enterprises Limited
- Uganda National Bureau of Standards (UNBS)
- Uganda National Farmers Federation (UNFF)
- Uganda National Seed Potato Producers Association (UNSPPA)
Acknowledgement

This standard and other standards for potato and potato products were developed with support from the Association for Strengthening Agricultural Research in Eastern and Central Africa –Policy Analysis and Advocacy Programme (ASARECA-ECAPAAP) project. The project helped in the mobilisation of stakeholders and covered some of the costs involved in the process of formulation of the standards. This support and the contribution of all other stakeholders is hereby acknowledged.
Introduction

Potato chips are one of the deep-fried snack foods available on the market. Such products are very popular for reasons of taste and nutritional value. Fried potato chips, also known as potato French fries, are usually prepared by peeling and slicing or shredding potatoes and deep-fat frying the slices/shreds in suitable edible oil or fat, or combinations thereof. In the case of sliced potatoes, these are sliced breadthwise to give thin slices. The slices/shreds are washed and fried in fat/oil or combinations thereof, held at proper temperature and time to render them ready. Salt and other seasonings are added after frying. When groundnut or other unsaturated oils are used, permitted antioxidants in the frying medium are sufficient to give protection to the potato chips.

Success in deep fat frying of chips depends upon several factors, such as:

a) use of proper raw material of optimum maturity and quality;

b) correct method of preparation;

c) use of suitable equipment;

d) selection of appropriate fat or oil as frying medium;

e) optimum time and temperature of frying;

f) efficient packaging; and

g) proper storage.

This standard will assist in the manufacture and sale of standardized, nutritious, and safe hygienically processed products. It provides requirements for assessing the quality and safety of potato chips. Complying with these requirements will enable the products to meet the minimum quality and safety expectation of consumers and regulators.
Fried potato chips — Specification

1 Scope

This Uganda Standard prescribes the requirements and the methods of sampling and test for fried potato chips.

2 Normative references

The following referenced documents are indispensable for the application 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.

US 7, General standard for labeling of prepackaged foods

US 28, Code of practice for hygiene in the food and drink manufacturing industry

US 45, General standard for food additives

US 168, Edible oils and fats — Specification

US 203, Specification for edible (fortified) salt

US EAS 98, Curry powder — Specification

US EAS 217-5, Methods for the microbiological examination of foods — Part 5: Enumeration of coagulase-positive staphylococci

US ISO 7251, Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique

US 705, Fresh potatoes — Specification

3 Terms and definitions

For the purposes of this standard, the following term and definition shall apply.

fried potato chips
product prepared from clean, mature, sound tubers of the potato plant of the species *Solanum tuberosum* L. and subjected to a deep frying process to make them crispy and ready for consumption

4 Essential quality and compositional requirements

4.1 Essential ingredients

The following materials shall be used in the preparation of fried potato chips:
a) potatoes; conforming to US 705; and

b) edible oil or fat conforming to US 168.

The potatoes for making chips shall be free from insects and insect residues, rodent hair and excreta, and fungal infestation.

The oil or fat for use in frying shall be suitable for consumption.

4.2 Optional ingredients

In addition to the essential ingredients specified in 4.1, the following optional ingredients may be added:

a) spices and condiments conforming to US EAS 98. These shall be clean, freshly ground, such as, chilli, pepper or others or combinations thereof, free from infection, infestation, foreign matter and any undesirable odour or taste; and

b) salt shall conform to US 203.

4.3 General quality factors

Fried potato chips shall:

- have characteristic colour;
- have acceptable texture;
- have a uniform surface, free from blisters and excessive brown pigmentation;
- not be excessively greasy; and
- be free from rancidity, bitterness and other objectionable odours and taste.

4.4 Specific quality requirements

The fried potato chips shall conform to the requirements given in Table 1.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Requirement</th>
<th>Methods of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid insoluble ash, % by mass (on dry basis), max.</td>
<td>0.15</td>
<td>Annex B</td>
</tr>
<tr>
<td>Acid value of extracted fat, %, by mass max.</td>
<td>2.0</td>
<td>Annex C</td>
</tr>
<tr>
<td>Peroxide value, meq. oxygen/kg fat, max.</td>
<td>10</td>
<td>Annex D</td>
</tr>
</tbody>
</table>

Note 1 Chips should be made from mature potatoes to prevent development of off odours.

Note 2 Reuse of frying oil may promote the degradation of oil and development of toxic compounds.

5 Food additives

Additives may be used in accordance with US 45.
6 Contaminants

6.1 Heavy metals
Potatoes chips shall conform to those maximum levels of heavy metals recommended by the Codex Alimentarius Commission for this commodity.

6.2 Pesticide residues
Potatoes shall comply with those maximum residue limits recommended by Codex Alimentarius Commission (CAC/RS./100 – 1978).

7 Hygiene
The fried potato chips shall be prepared, packaged and stored under hygienic conditions in accordance with US 28. The chips shall conform to the microbiological limits in Table 2.

<table>
<thead>
<tr>
<th>Microorganism</th>
<th>Maximum limits</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. coli</em>, CFU per gm, max</td>
<td>&lt; 1</td>
<td>US ISO 7251</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em>, in 25 g</td>
<td>Negative</td>
<td>US EAS 217-5</td>
</tr>
</tbody>
</table>

8 Packaging
Potato chips for distribution shall be packaged in such a way to safeguard the hygienic and nutritional quality of the product.

The container including packaging material shall not impart any toxic substance and smell to the product.

The chips shall be packaged and distributed in such a way as to retain the contents in a fresh condition as supplied.

9 Labelling
In addition to the requirements of US 7, the following particulars shall be marked or labelled on each container:

a) name of the product shall be “Fried potato chips”; if the chips are spiced the product shall be labelled as “Spiced fried potato chips”;

b) name, address and location of the manufacturer;

c) date of manufacture;

d) date of expiry;

e) country of origin;

f) list of ingredients;

g) net weight; and
h) lot identification such as batch number or code

10 Weights and measures

The weights of the packages of potato chips shall be in accordance with the weights and measures regulations.

11 Methods of sampling

Representative samples for determining the conformity of the material to the requirements of this specification shall be drawn in accordance with the procedure given in Annex A.
Annex A
(normative)

Sampling of fried potato chips

A.1 General requirements

In drawing, storing, preparing and handling test samples, the following precautions and directions shall be observed:

a) samples shall be taken in a protected place not exposed to damp air, dust or soot;

b) sampling instruments shall be clean and dry;

c) samples shall be placed in clean and dry containers;

d) sample containers shall be of such a size that they are almost completely filled by the sample;

e) precautions shall be taken to protect the samples, the material being sampled, the sampling instruments and the sample containers from adventitious contamination; and

f) each sample container shall be sealed with a stopper or a suitable closure after filling in such a way that it is not possible to open and reseal it without detection, and marked with full details of sampling, such as, name of the material, name of the manufacturer, type of package and other important particulars of the consignment.

A.2 Scale of sampling

A.2.1 All the packages in a single consignment of the same type, manufactured under relatively uniform conditions of production and having similar composition shall constitute a lot.

A.2.2 Samples shall be tested from each lot separately for ascertaining the conformity of a lot to the requirements of this specification.

A.2.3 The number of packages to be selected from a lot shall depend on the size of the package as well as the size of the lot and shall be according to Table 2.

These packages shall be selected from the lot at random.
Table 2 — Number of packages to be selected for sampling

<table>
<thead>
<tr>
<th>Number of packages in the lot</th>
<th>Sample size</th>
<th>Number of packages in the lot</th>
<th>Sample size</th>
<th>Number of packages in the lot</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 100</td>
<td>8</td>
<td>Up to 50</td>
<td>3</td>
<td>Up to 50</td>
<td>2</td>
</tr>
<tr>
<td>101 - 300</td>
<td>13</td>
<td>51 - 100</td>
<td>5</td>
<td>51 - 100</td>
<td>3</td>
</tr>
<tr>
<td>301 - 500</td>
<td>20</td>
<td>101 - 300</td>
<td>8</td>
<td>101 - 300</td>
<td>5</td>
</tr>
<tr>
<td>501 - 1000</td>
<td>32</td>
<td>301 - 500</td>
<td>13</td>
<td>301 and above</td>
<td>8</td>
</tr>
<tr>
<td>1001 and above</td>
<td>50</td>
<td>501 and above</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A.3 Test samples and referee samples

A.3.1 Draw small portions of the material with a suitable sampling instrument from different parts of each selected package. The total quantity of material drawn from each package shall be sufficient to make triplicate determinations for all the characteristics given in the specification.

A.3.2 Mix all portions of the material drawn from each selected package thoroughly. Out of the mixture, a small but approximately equal quantity of material shall be taken and mixed thoroughly so as to form a composite sample sufficient to make triplicate determinations for all the characteristics given in this specification.

The composite sample so prepared shall be divided into three equal parts, one for the purchaser, another for the supplier and the third for the referee. These parts shall be immediately transferred to clean and dry containers, which are then sealed airtight and labelled with all the particulars given in B.1.6.

The referee sample shall bear the seals of the purchaser and the supplier so as to be used in case of a dispute between the two.

A.4 Number of tests and criteria for conformity

A.4.1 All the characteristics given in this specification shall be tested on the composite sample.

A.4.2 The lot shall be declared as conforming to the requirements of this specification if all the test results on the composite sample meet the corresponding specification requirements.
Annex B  
(normative)

Determination of acid insoluble ash

B.1 Reagents

Hydrochloric acid, approximately 5 N, prepared from concentrated hydrochloric acid

B.2 Procedure

Weigh accurately about 5 g of the material in a platinum, porcelain or silica dish. Ignite the material in the dish with the flame of a suitable burner till all the starch is carbonized. Complete the ignition in a muffle furnace at 550 °C ± 25 °C for 3 h. Cool in a desiccator.

To the ash, add 25 mL of hydrochloric acid, cover with a watch-glass and heat on a water-bath for 10 min. Allow to cool and filter the contents of the dish through Whatman Filter Paper No. 42 or its equivalent. Wash the filter paper with water until the washings are free from the acid. Return the filter and the residue to the dish. Keep it in an electric air oven maintained at 105 °C to 110 °C for about 3 h. Ignite in a muffle furnace at 550 °C ± 20 °C for 3 h. Cool the dish in a desiccator and weigh.

Repeat the process of igniting in the muffle furnace, cooling and weighing at half-hour intervals until the difference between two successive weighings is less than one milligram. Note the lowest mass.

B.3 Calculation

\[ \text{Acid insoluble ash (on dry basis)} = \frac{10000 \times (M_2 - M)}{M_1 (100 - X)} \]

where

- \( M_2 \) is the mass, in grams, of the dish with the acid insoluble ash;
- \( M \) is the mass, in grams, of the empty dish;
- \( M_1 \) is the mass, in grams, of the sample; and
- \( X \) is the moisture content, percent by mass.
Annex C
(normative)

Determination of acid value of extracted fat

C.1 Reagents

C.1.1 Benzene-alcohol-phenolphthalein stock solution — To one litre of distilled benzene, add one litre of alcohol or rectified spirit and 0.4 g of phenolphthalein. Mix the contents well.

C.1.2 Standard potassium hydroxide solution, 0.02 N

C.1.3 Standard potassium permanganate solution, 0.01 %

C.1.4 Potassium dichromate solution, 0.5 %

C.2 Procedure

Dissolve the residue in the extraction flask with 50 mL of the benzene-alcohol-phenolphthalein solution. Titrate the dissolved extract with standard potassium hydroxide solution to distinct pink colour, or in the case of yellow solution to orange pink colour. If an emulsion is formed during titration, dispel by adding a second 50-mL portion of the benzene alcohol-phenolphthalein solution. The endpoint should match colour of the solution made by adding 2.5 mL of standard potassium permanganate solution to 50 ml of potassium dichromate solution of proper strength to that of the original solution being titrated. (Add 0.5 % potassium dichromate solution dropwise to 50 mL of water until the colour matches. Then add 2.5 mL of standard potassium permanganate solution).

Make a blank titration on 50 mL of the benzene-alcohol-phenolphthalein solution and subtract this value from the titration value of the sample.

If the additional 50 mL portion of the benzene-alcohol-phenolphthalein solution is added, double the blank titration.

C.3 Calculation

\[
\text{Acid value of extracted fat (as oleic acid)} = \frac{56.4 \times VN}{M}
\]

where

\( V \) is the volume, in millilitres, of standard potassium hydroxide solution used;

\( N \) is the normality of standard potassium hydroxide solution; and

\( M \) is the mass, in grams, of the material taken for the test.
Certification marking

Products that conform to Uganda standards may be marked with Uganda National Bureau of Standards (UNBS) Certification Mark shown in the figure below.

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