



Technical Specifications for the manufacture of:

GOFIO

Specification reference: **Gofio**

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1. INTRODUCTION

1.1 Product purpose

Gofio is a product for adults and children over than 6 months.

1.2 Product type

Gofio is prepared from heat treated maize. If **Gofio** is consumed as a porridge or gruel, it should be prepared by mixing an appropriate proportion of flour and clean water (i.e. 40g of **Gofio** with 250 g of water) followed by a boiling time at simmering point from five to ten minutes.

1.3 Standards and recommendations

Gofio shall comply, in terms of raw materials, composition or manufacture, except when specified otherwise in the contract, with the following guidelines or standards of Codex Alimentarius.

- Guidelines on Formulated Supplementary Foods for Older Infants and Young Children, CAC/GL 08-1991 of the Codex Alimentarius.
- Code of Hygienic Practice for Foods for Infants and Children CAC/RCP 66 - 2008 of the Codex Alimentarius.
- Recommended International Code of Practice: General Principles of Food Hygiene CAC/RCP 1-1969 Rev 4 - 2003 including Annex “Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its application”.
- General principles for addition of essential nutrients to foods: CAC/GL 09-1987 (amended 1989, 1991), of the Codex Alimentarius.

2. RAW MATERIALS

2.1 Main ingredients

Gofio shall be manufactured from fresh maize grain of good quality, free from foreign materials, substances hazardous to health, excessive moisture, insect damage and fungal contamination and shall comply with all relevant national food laws and standards. Requirements for the raw materials are:

Maize

- Conform to Codex STAN 153-1985.
- Be tested for aflatoxin (recommended method AACC 45-05 or AOAC 26.049 / 1984).
- Be obtained from non-genetically modified varieties (*if required by the contract*).

Maize must be stored under dry, ventilated and hygienic conditions. Only safe insecticides (i.e. phosphine) may be used for fumigation control. Where needed, fumigation must be performed by certified operators.

3. PROCESSING

Gofio shall be processed as a partially pre-cooked food under conditions which permit improvements in the digestibility of starches and proteins. Preferred heat treatment is roasting or toasting.

4. PRODUCT SPECIFICATIONS

4.1 Moisture content 8.0 % maximum

4.2 Nutritional value: it shall contain the following nutritional value per 100 g dry matter:

- Protein 6.0 % (N x 6.25) minimum
- Fat 4.5 % maximum
- Crude fibre 3.5 % maximum
- Ash 1.4 % maximum

4.3 Flour characteristics

Particle size

It shall have a uniform fine texture with the following particle distribution:

- 95% must pass through a 600 microns sieve.
- 100% must pass through a 1,000 microns sieve.

Organoleptic: it shall have a pleasant smell and palatable taste.

4.4 Microbiology

Microbiological contamination of **Gofio** shall not to exceed the levels in table 1:

Table 1: Limit of microorganisms in **Gofio**

| Microorganisms | Maximum levels |
|------------------------------|-------------------|
| Mesophyllic aerobic bacteria | 100,000 cfu per g |
| Coliforms | 100 cfu per g |
| Salmonella | 0 cfu per 25g |
| Escherichia Coli | <10 cfu per g |
| Staphylococcus aureus | <10 cfu per g |
| Bacillus cereus | 50 cfu per g |
| Yeasts and moulds | 1,000 cfu per g |

4.6 Contaminants

Gofio shall be free from objectionable matter; not contain any substances originating from micro-organisms or any other poisonous or deleterious substances such as anti-nutritional factors, heavy metals or pesticide residues, in amounts which may represent a hazard to health.

- Permitted level of total aflatoxin: 20 ppb (B1, B2, G1, G2).
- Heavy metals: below levels specified in Codex Stan 193-1995, in particular Pb max 20 ppb and Cd max 100 ppb.

4.7 Shelf life

It shall retain above qualities for at least 12 months from date of manufacture when stored dry at ambient temperatures prevalent in the country of destination.

4.8 Fit for human consumption guarantee

Suppliers shall have to check the quality of their products and guarantee that they are '**fit for human consumption**'.

4.9 Additional Requirements

Peroxide value: max 10 meq/kg fat.

Dispersiveness: it shall be free from lumping or balling when mixed with water of ambient temperature.

Cooking time: it shall be suitable for children and adults after a boiling at simmering point for a minimum of five minutes and a maximum of ten minutes.

5. PACKAGING

Gofio must be packed in new uniform strong polypropylene bags of a net content of 25 kg, fit for export and multiple handing. All bags have separate plastic inner lining of 75 microns. Polypropylene bags, the outer bag must have a heat cut mouth to prevent fibrillation and have sewn single folder bottom. Bag specification: size 50 cm x 75 cm in dimensions, tare about 110g each. Bags made of woven PP are to be given special food grade "ultraviolet" treatment. Construction of fabric must be solid to sustain harsh handling. The inner liner should be heat-sealed and outer bags double stitched.

Two (2%) percent marked bags (included in the price) must be sent with the lot.

6. MARKING

- Name and logo of the product.
- Net content: 25kg.
- Name and address of the supplier (including country of origin).

- Production date.
- Additional marking as per contractual agreement.

7. STORING

Gofio must be stored under dry, ventilated and hygienic conditions.

8. ANALYTICAL REQUIREMENTS

The principal analyses/tests in table 2 must be performed in order to check if the quality of the **Gofio** meets above requirements. Additional analyses shall be defined in case of further quality assessment.

Table 2: List of compulsory tests and reference methods

| No | Analyses/tests | Recommended level | Reference method (Or equivalent) |
|--|------------------------------------|--|-------------------------------------|
| Main composition | | | |
| 1 | Moisture | 8.0 % (<i>maximum</i>) | ISO 712: 2009 |
| 2 | Protein | 6.0% (N x 6.25) (<i>minimum</i>) | AOAC 981.10 ISO 20483:2006 |
| 3 | Fat | 4.5 % (<i>maximum</i>) | AOAC 954.02 ISO 11085:2008 |
| 4 | Crude fibre | 3.5 % (<i>maximum</i>) | AOAC 962.09 |
| 5 | Ash | 1.4 % (<i>maximum</i>) | ISO 2171:2007 |
| Chemico-physical characteristics of flour | | | |
| 6 | Peroxide value | 10 meq/kg fat, (<i>maximum</i>) | AOAC 965.33 |
| 7 | Particle size | - 95% must pass through a 600 microns sieve. - 100% must pass through a 1,000 microns sieve | |
| 8 | Organoleptic (smell, taste, color) | Pleasant smell and palatable taste, typical color | |
| Mycotoxins | | | |
| 9 | Aflatoxin (total) | 20 ppb (total of B1, B2, G1, G2) (<i>maximum</i>) | AACC 45-16 |
| Microorganisms | | | |
| 10 | Mesophyllic aerobic bacteria | 100,000 cfu per g (<i>maximum</i>) | ICC No 125 AACC 42-11 |
| 11 | Coliforms | 100 cfu per g (<i>maximum</i>) | AOAC 2005.03 |
| 12 | Salmonella | 0 cfu per 25g | AACC 42-25B |
| 13 | Escherichia Coli | <10 cfu per g | AOAC 991.14 |
| 14 | Staphylococcus aureus | <10 cfu per g | AACC 42-30B |
| 15 | Bacillus cereus | 50 cfu per g (<i>maximum</i>) | AOAC 980.31 |
| 16 | Yeasts and moulds | 1,000 cfu per g (<i>maximum</i>) | ICC No 146 AACC 42-50 |
| 17 | GMO (<i>only if required</i>) | Negative (< 0.9% of GMO material) | |