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STANDARD**

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Egg Albumen Flakes - Specification

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Foreword

This Ethiopian Standard has been prepared under the direction of Technical Committee for Food product in general (TC 91) and published by the Institute of Ethiopian Standards (IES).

The standard has been developed to address observed needs and to support the local industry in order to make progress through uprising competitiveness and maintain comparative market advantage both domestically and internationally.

Information has been gathered from various relevant resources in developing it.

Codex Stan 192, General standard for food additives

Codex Stan 193, General standard for contaminants and toxins in food and feed.

Acknowledgement is made for the use of information from the above publication.

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Egg Albumen Flakes - Specification

1. Scope

This Ethiopian Standard specifies the requirements, method of sampling for egg albumen flakes obtained from chicken for human consumption.

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.

ES ISO 8968-1, Milk and milk products — Determination of nitrogen content — nitrogen content — Part 1: Kjeldahl principle and crude protein calculation

ES ISO 8968-4, Milk and milk products — Determination of nitrogen content — nitrogen content — Part 4: Determination of protein and non-protein nitrogen content and true protein content calculation (Reference method)

ES 577, General Principles of Food Hygiene – Recommended Code of Practice

ES 929, Code of Practice – Food Hygiene Management

ES ISO 22002-1, Prerequisite programmes on food safety — Part 1: Food manufacturing

ES ISO 2917, Meat and Meat products – Measurement of pH (Reference method)

ES 1117, Tin in canned foods, atomic absorption spectrophotometric method

ES ISO 6579-1, Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of salmonella,

ES ISO 4833-1, Microbiology of the food chain – Horizontal method for the enumeration of microorganisms Part 1: Colony count at 30 °C by the pour plate technique,

ES ISO 4831, Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms — Most probable number technique

ES ISO 4832, Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of coliforms - Colony-count technique,

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

ES ISO 21527-1, Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds Part 1: Colony count technique in products with water activity greater than 0,95

ES ISO 21527-2, 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

ES ISO 6888-1, Microbiology of the food chain — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) Part 1: Method using Baird-Parker agar medium

ES ISO 6888-2, Microbiology of the food chain — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) Part 2: Method using rabbit plasma fibrinogen agar medium.

CES 73, General Standard for Prepackaged Foods - Labelling

ES ISO 1736, Dried milk and dried milk products — Determination of fat content — Gravimetric method (Reference method)

3. Terms and Definitions

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

3.1.

chicken

a type of bird domesticated or kept on a farm for its eggs or its meat, or the meat of this bird that is cooked and eaten.

3.2.

egg albumen

is the homogeneous product obtained from the separation of the egg albumen of broken-out hen eggs-in-shell, in accordance with good manufacturing practice.

3.3.

homogenization

any of several processes used to make a mixture of two mutually non-soluble substance uniform.

3.4.

dirty egg

an egg that has a shell that is unbroken and has adhering dirt or extraneous matter , or stains covering more than ¼ of the shell surface.

3.5.

emulsion

a mixture of two or more liquids that are normally immiscible (unmixable or unblendable). Emulsions are part of a more general class of two-phase systems of matter called colloids.

3.6.

emulsion capacity

parameter used to estimate oil in water emulsion, gives a maximum amount of oil that is combined before inversion.

3.7.

incubator egg

egg that has been previously put under the incubator and provided environmental controlled conditions, such as temperature and humidity for hatching but fail to hatch.

3.8.

desiccator

is a sealable enclosure containing materials used for preserving moisture-sensitive items such as cobalt chloride paper for another use. A common use for desiccators is to protect chemicals which are hygroscopic or which react with water from humidity.

3.9.

food additive

any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which to food for a technological (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food results, or may be reasonably expected to result(directly or indirectly),initor its by-products becoming a component of or otherwise affecting the characteristics of such foods.

3.10.

colloid

a homogeneous, non-crystalline substance consisting of large molecules of one substance dispersed through a second substance. Colloids include gels, sols, and emulsions, the particles do not settle and cannot be separated out by ordinary filtering or centrifuging like those in a suspension.

4. Description of the product

It is thin, dried flakes produced from the liquid white (albumen) of eggs, obtained by pasteurizing, concentrating, and dehydrating the albumen under controlled conditions. The product is usually white to pale cream in color, has a neutral odor and taste, and possesses excellent foaming and gelling properties.

5. Requirements

5.1. General Requirements

egg albumen flakes shall:

- 5.1.1. be homogeneous;
- 5.1.2. be practically free from shell fragments, and foreign matter;
- 5.1.3. have taste and odour of the natural characteristics of the egg;
- 5.1.4. have a uniform white to pale cream colour and a smooth and uniform texture,
- 5.1.5. be free from lumps and gritty material;
- 5.1.6. retain the original properties of fresh egg, like solubility of protein, aerating capacity, binding power and palatability.
- 5.1.7. The eggs used shall:
 - 5.1.7.1. have the ability to produce flakes
 - 5.1.7.2. not be incubator eggs;
 - 5.1.7.3. not be contaminated with the egg content of dirty and spoiled eggs.
 - 5.1.7.4. not be broken
 - 5.1.7.5. be properly washed, dried and cooled,
 - 5.1.7.6. Glucose present in the liquid contents of original eggs should be removed before drying, if necessary.

5.2. Specific Requirements

The egg albumen flakes shall comply with the chemical requirements as given in Table 1 below.

Table 1 Chemical requirement for the product

Characteristics	Requirement	Test Methods
Solid matter content,% by mass, Min.	84	AOAC 925.30
Protein, % by mass, Min.	71	ES ISO 8968-1 ES ISO 8968-4
Total fat % by mass, Min.	0.5	ES ISO 1736
pH	4	ES ISO 2917
Beta-hydroxy butyric acid, mg/Kg, Max	10	AOAC 970.31

6. Food Additives

Food additives in the egg albumen flakes shall comply with Codex Stan 192.

7. Contaminant

7.1. Veterinary Drug Residues

- 7.1.1 The product shall have a maximum residual limit for veterinary drugs in accordance with CAC/MRL-2.
- 7.1.2 The product shall comply with those maximum limits for metal contaminants specified in Codex Stan.193, and in particular listed in Table 3 below.

Table 3 Metal limits in Egg Albumen Flakes

Characteristics	Maximum limit, mg/kg (ppm)	Test Methods
Lead	0.1	AOAC 999.10
Arsenic	0.2	AOAC 942.17
Mercury	0.1	AOAC 952.14
Cadmium	0.1	AOAC 999.10
Tin	250	ES 1117

8. Hygiene

- 8.1. The product shall be manufactured and handled in a hygienic manner in accordance with ES 577, ES 929 and ES ISO 22002-1.
- 8.2. The product shall be stored and transported following hygienic practices in accordance with CAC/RCP15.
- 8.3. The product shall be free of pathogenic microorganisms and shall conform to the microbiological requirements in Table 2 below.

Table 2 Microbiological Requirements for Egg Albumen Flakes

Characteristics	Limit	Test Methods
<i>Salmonella spp</i>	Absent	ES ISO 6579-1
Total plate count, cfu per gram, Max.	10 ⁴	ES ISO 4833-1
Coliform count, cfu per gram, Max.	10	ES ISO 4831 ES ISO 4832
<i>E.coli</i> , cfu per gram.	Absent	ES ISO 7251
Yeast and mould count, cfu per gram, Max.	10	ES ISO 21527-1 ES ISO 21527-2
<i>Staphylococcus aureus</i>	Absent	ES ISO 6888-1 ES ISO 6888-2

9. Packaging and Labelling

9.1. Packaging

- 9.1.1. The product shall be packed with suitable and food grade quality packages of clean, sound, free from insects and fungal infestation.
- 9.1.2. It shall be packed in containers which will safeguard the hygienic, nutritional, and organoleptic qualities of the products.
- 9.1.3. The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They shall not impart any toxic substance or undesirable odor or flavor to the product.

9.2. Labelling

The labelling shall comply with the requirements of CES 73 and shall be legibly and indelibly marked with the following:

- The name of product as **"Egg albumen flakes"**;
- Nutritional information;
- Net content, declared by mass in metric units;
- Name and physical address of the manufacturer, packer, distributor, importer, or exporter;
- Expiry date (DD/MM/YYYY)
- Date of production (DD/MM/YYYY);
- Instructions of storage;
- Lot number or batch number; and
- Country of origin.

10. Sampling Method

Sampling shall be done in accordance with the method prescribed in Annex A.

Annex A

(Normative)

Sampling of Egg Albumen Flakes

A-1. General Requirements of Sampling

A-1.0 In drawing, preparing, storing, and handling samples, the following precautions and directions shall be observed.

A-1.1 Samples shall be taken in a protected place not exposed to damp air, dust, or soot.

A-1.2 The sampling instrument shall be clean and dry when used.

A-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument, and the containers for samples from adventitious contamination.

A-1.4 The samples shall be placed in clean, odourless, and dry glass containers. The sample containers shall be of such a size that they are almost completely filled by the sample.

A-1.5 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer, and other important particulars of the consignment.

A-1.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

A-1.7 Sampling shall be done by a person agreed to between the purchaser and the vendor, and in the presence of the purchaser (or his representative) and the vendor (or his representative).

A-2. Scale of Sampling

A-2.1 Lot —All the containers in a consignment belonging to the same batch of manufacture shall constitute a lot.

A-2.1.1 Samples shall be tested from each lot for ascertaining conformity of the material to the requirements of the specification.

A-2.2 The number of containers to be tested from a lot shall depend on the size of the lot and shall be in accordance with Table 4.

Table 4 Number of containers to be selected for sampling

Total Number of Containers in the Lot (N)	Number of Containers to be Selected (n)
1 or 2	All containers
3 to 15	3
16 to 40	5
41 to 110	8
111 to 500	13
501 to 800	22
Above 800	32

A-2.3 The containers to be selected for sampling shall be chosen at random from the lot and, for this purpose, random number tables (see also IS: 4905-1968*) shall be used. In case such tables are not available, the following procedure may be adopted:

Starting from any container, count them as 1, 2, 3, ... up to N, and so on, in a systematic manner. Every r^{th} container thus counted shall be chosen, r being the integral part of N/n (see Table 2).

A-3. Test Samples and Referee Samples

A-3.1 Preparation of Laboratory Samples — Empty out the contents of the container on a sheet of paper and mix thoroughly. Cone and quarter as often as necessary until about 150 g of the material is left. From this, take about 75 g of the material and divide it into three equal parts. Each part so obtained shall constitute an individual sample representing the container and shall be transferred immediately to thoroughly clean and dry containers, sealed air-tight, and labelled with particulars given in A-1.5. The individual samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, the other for the vendor, and the third for the referee.

A-3.2 Preparation of a Composite Sample — From the material remaining in each selected container after the individual sample has been taken, equal quantities of the material shall be taken and mixed together so as to form a composite sample weighing not less than 150 g. This composite sample shall be divided into three equal parts and transferred to clean and dry glass containers and labelled with the particulars given in A-1.5. One of these composite samples shall be marked for the purchaser, the other for the vendor, and the third for the referee.

A-3.3 Referee Samples — Referee samples shall consist of a set of individual samples (see A-3.1) and a composite sample (see A-3.2) marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed upon between the two.

A-4. Number of Tests

A-4.1 Tests for requirements given in A-2.2 shall be conducted on each of the samples constituting a set of individual test samples (see A-3.1).

A-4.2 Tests for moisture, total ash, acid insoluble ash, crude fibre, and alcoholic acidity shall be conducted on the composite sample (see A-3.2).

A-5. Criteria for Conformity

A-5.1 The lot shall be considered satisfactory in respect of the requirements of A-4.1 if each individual sample satisfies all the requirements.

A-5.2 The lot shall be considered satisfactory in respect of the requirements of A-4.2 if the test results on the composite sample satisfy the corresponding requirements.

A-5.3 The lot shall be declared to be in conformity with all the requirements of this specification if it has been found satisfactory in accordance with A-5.1 and A-5.2.

Bibliography

AOAC 999.10, Lead, Cadmium, Zinc, Copper and Iron in Foods: Atomic Absorption Spectrophotometry after Microwave Digestion

AOAC 942.17 Arsenic in Food: Molybdenum Blue Method

AOAC 952.14 Mercury in food (dithizone method-colorimetry)

AOAC 925.30 – Total Solids in Eggs (Vacuum Oven Method)

AOAC 970.31, Beta-hydroxybutyric, Lactic, and Succinic acids

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Organization and Objectives

The Institute of Ethiopian Standards (IES) is the national standards body of Ethiopia. IES is re-named by the proclamation number 1263/2021, from Ethiopian Standards Agency (ESA) to Institute of Ethiopian standards, with the mandate given by the regulation Number, 193/2010 and proclamation number, 1263/2021.

IES's objectives are:

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and service are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.
- ❖ Conduct standards related research and provide training and technical support.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational and research institutes, governmental organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.

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