



JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FOOD ADDITIVES

Fifty-third Session

DISCUSSION PAPER ON THE DEVELOPMENT OF A STANDARD FOR YEAST

BACKGROUND

In the forty-fourth session of the Codex Alimentarius Commission (CAC44), China introduced the proposal for the development of a Codex standard for yeast¹. China requested guidance from CAC44 regarding the Codex committee that could undertake new work on yeast, a product that has a wide application globally, noting that this product fell outside of the Terms of Reference (ToRs) of the existing committees. CAC44 agreed that the discussion paper on the development of a standard for yeast should be presented at the next session of CCFA.

China has revised the new work proposal document, taking into account the discussion and recommendations of the CAC44, about the revision of the GSFA Category 12.8 on yeast and yeast products to include yeast containing cultures for kefir in the *Standard for Fermented milks* (CXS 243-2003), and the information that ISO has begun their work on microbial food cultures including yeast and that such work be considered by Codex moving forward, as well as a suggestion to exclude yeast used to produce alcoholic beverages.

CCFA53 is invited **to consider** the attached new work proposal (Appendix I) for the future work of the Committee.

¹ REP21/CAC paragraphs 151-153

Proposal for the Development of a Codex Standard for Yeast

1. The Purposes and Scope of the Standard

This standard applies to yeast products for baking, brewing and other purposes. Currently, there is no harmonized international standard for yeast. The regulations and standards for yeast are various among countries, and there are still many countries which do not have standard for yeast.

The purpose of this standard is to protect the health of consumers and promote fair practices in food trade in accordance with the purpose of the Codex.

2. Product definition

Yeast: it refers to biological leaven agents, brewing agents or food ingredients, with the function of producing carbon dioxide, alcohol or increasing food flavor and nutrition or others, which is inoculated with yeast strains and goes through fermentation, separation, filtration, drying or not drying and other processes. The production process is shown in Figure 1.

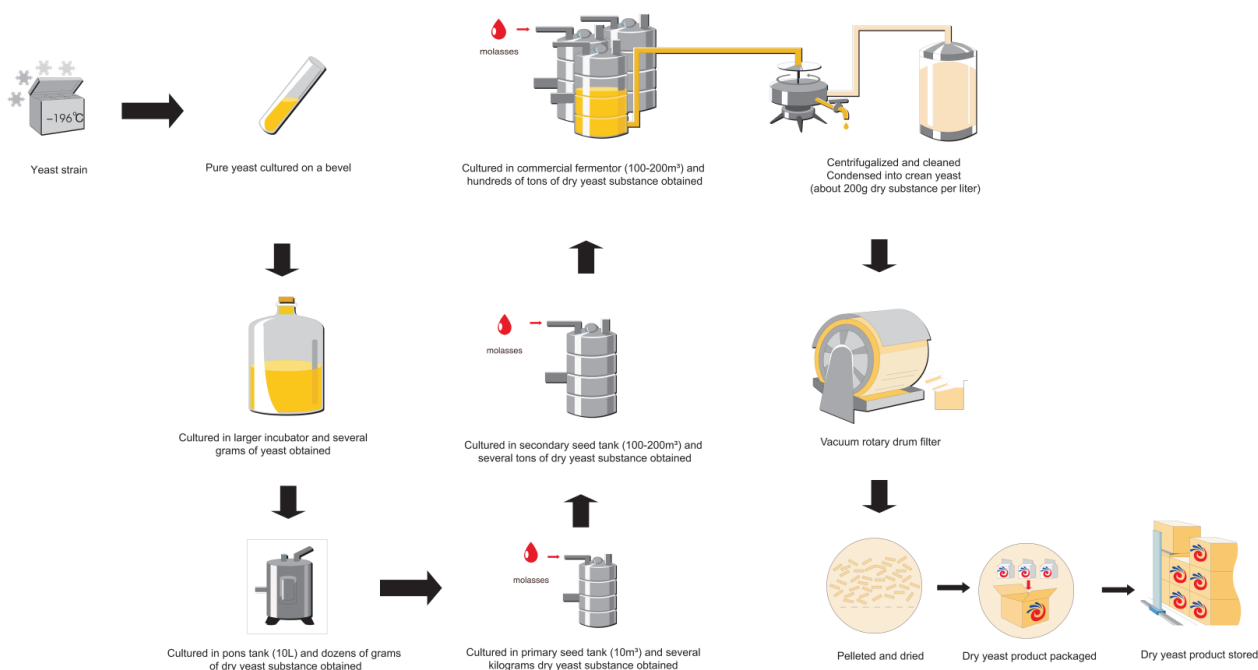


Figure 1 Production process diagram of yeast

Products can be classified into baker's yeast, brewer's yeast and edible yeast according to their application scope; products can be classified into liquid yeast, fresh yeast and dry yeast according to their moisture content. At present, the major international yeast producers are Angel, Lesaffre and AB Mauri. See Figure 2 for representative products in the market.



Figure 2 Representative products in the market

3. Relevance and Timeliness

Yeast products has wide applications and broad market potential, due to the improvement of fermentation technology and production technology, production concentration and unit yield have also been continuously improved, which has further promoted the international trade of yeast products. According to the industry reports and data of customs, the global yeast market was valued at US\$3.26 billion in 2018 and is expected to reach US\$5.89 billion by 2026, with a compound annual growth rate of 8.8%. From 2016 to 2019, the global yeast import and export trade remained at around US\$2.5 billion each year. The detailed data is shown in Figure 3 and Figure 4.

At present, yeast products is widely used in countries in Asia, Europe, Latin America and the Caribbean, North America and the Southwest Pacific, Africa, and the Middle East region. However, the Codex Alimentarius Commission has not yet formulated the standard for yeast, and there is no harmonized standard among various trading countries have caused many obstacles to international trade. Therefore, the Codex standard for yeast will benefit the trade between countries and regions in the world and it is predicted that yeast products will have greater consumption demand and trade potential in the international market in the future.

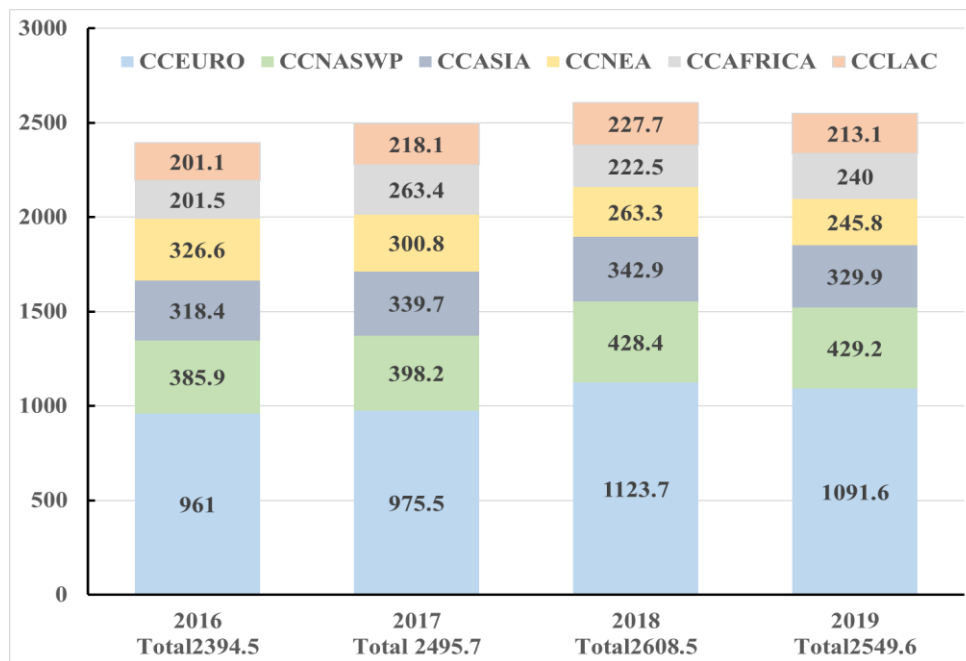


Figure 3 2016-2019 Global Yeast Total Imports (Million US\$)

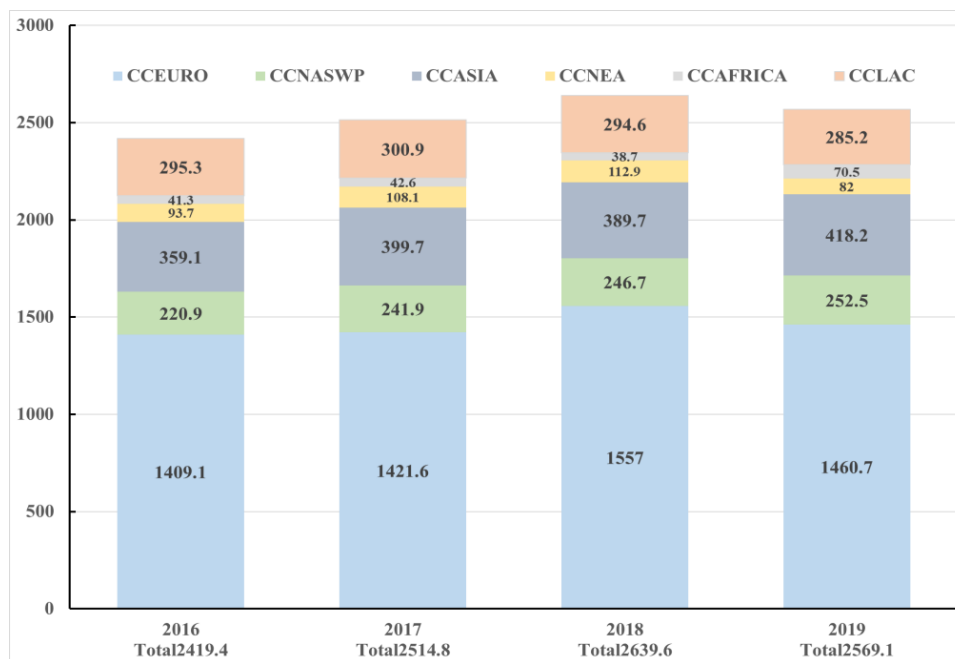


Figure 4 2016-2019 Global Yeast Total Outputs (Million US\$)

Note: Data source:

https://oec.world/en/visualize/tree_map/subnational_can/export/show/show/4210210/2019/

4. Main Aspects to be covered

The main aspects to be covered by the Codex standard for yeast include scope, description, types, essential composition and quality factors, food additives, contaminants, food hygiene, labeling, packaging, transportation and storage as well as methods of analysis and sampling. The use of food additives and contaminant limits of the product will follow the requirements of the existing CAC texts.

5. Assessment against the Criteria for the Establishment of Work Priorities

5.1 General Criterion

The standard aims at ensuring consumer health, food safety and fair food trade practice, especially taking into account the needs of developing countries. The new standard proposal will focus on the following aspects to meet the above requirements:

- Resolve consumers concerns about food safety by establishing product quality requirements;
- Eliminate trade barriers by unifying standard requirements.

5.2 Criteria applicable to commodities

a) Volume of production and consumption in individual countries and volume and pattern of trade between countries

In 2019, the global production of yeast products was around 1.73 million tons, a net increase of 220,000 tons compared to that of 2015, in which a net increase of 140,000 tons of yeasts.

Subject to factors such as raw materials, technology and environment, 75% of the global production of yeast products are located in Europe, Asia Pacific and North America. France, China, Turkey and Mexico are the world's major yeast exporters. The United States, France, Germany and the United Kingdom are major importers. The import and export amounts of major countries are shown in Table 1 and Table 2.

Table 1 Export value of major exporting countries (Million US\$)

Country	2016	2017	2018	2019
France	302	287	269	261
China	286	325	298	324
Turkey	214	219	222	201
Mexico	141	137	132	138
Belgium	132	130	151	146

Table 2 Import value of major importing countries (Million US\$)

Country	2016	2017	2018	2019
United States of America	284	291	318	320
France	108	105	121	126
Germany	87.5	75.7	101	96.1
United Kingdom	93.1	101	107	92.3
Belgium	56.4	71.5	79	77.9

b) Diversification of national legislation and apparent resultant or potential impediments to international trade

Different processing and consumption habits in various regions have led to differences in the classification, requirements and inspection methods of yeast products, which may affect the fair trade. For example, different regions have different requirements for contaminants, food hygiene and physical and chemical properties in yeast products, which leads to some trade barriers in importing and exporting yeast products between countries and regions.

c) International or regional market potential

The global yeast production, export volume and international trade volume continue to grow, and the global production and sales scale are expected to be 2 million tons in 2025. From 2016 to 2019, the global import and export trade data of yeast increased steadily, as shown in Figure 3 and Figure 4. In addition to continents such as Europe, Asia, and the Americas which have a longer history of yeast production and consumption, due to population growth and changes in dietary habits, as well as a great demand marketing in Africa, the Middle East, and Asia-Pacific, and the growth of market is steadily.

In addition to the traditional application in food processing such as baking, brewing and improving nutrition, and yeast can also be used as the raw material for yeast extract, yeast cell wall, autolyzed yeast and other derivative products. The formulation of this standard can also provide specifications for the control of raw materials for downstream producers.

d) Amenability of the commodity to standardization

The Codex standard for yeast will play a positive role in guiding the healthy development of the industry and improving the safety of yeast products. CAC has not formulated relevant standards for yeast. The current *General Standard for Food Additives* (CXS 192-1995) have the food category and description of yeast (FC 12.8), as well as food additive provisions in this food category, but Codex Alimentarius still lacks other specifications requirement for this whole food category.

At present, several regions have their own standards for yeast products. Each country has made specific requirements on sensory indicators, physical and chemical indicators and safety indicators of yeast products. There are many similarities between the standards. For example, most moisture content of dry yeast is less than 10%, while the moisture content of fresh yeast is usually around 70%. Most requirements on appearance, flavour and texture in standards of different countries or regions are consistent. In summary, it is feasible to develop a harmonized international standards for yeast.

e) Coverage of the main consumer protection and trade issues by existing or proposed general standards

There are no existing commodity standards covering yeast, it won't be conflict with any existing standards.

f) Number of commodities which would need separate standards indicating whether raw, semi-processed or processed

At present, apart from this proposed standard, there is no need to formulate other standards, because the proposed standard will cover all finished products, including raw materials of yeast and the production sanitary conditions for processed products. There is no semi-processed product or unprocessed product sold as a commodity in this product.

g) Work already undertaken by other international organizations in this field and/or suggested by the relevant international intergovernmental body(ies)

None were identified.

6. Relevance to the Codex Strategic Objectives

The proposed new standard project is in line with the *Strategic Plan 2020-2025 of the Codex Alimentarius Commission*, and the development of global standard for yeast is closely related to Goal 1.1 (understanding needs and emerging issues) and Goal 1.2 (prioritizing needs and emerging issues). As a global standard of yeast, it will help to improve the food safety for global consumers and ensure fair international trade practices for this particular food.

7. Information on the Relation between the Proposal and other Existing Codex Documents

The standard will be used in conjunction with all existing and relevant Codex standards. It will take into account the provisions of

- *General Principles of Food Hygiene* (CXC 1-1969),
- *General Standard for the Labelling of Prepackaged Foods*(CXS 1-1985),

- *General Standard for the Labelling of Food Additives When Sold as Such*(CXS 107-1981),
- *General Standard for Food Additives*(CXS 192-1995),
- *General Standard for Contaminants and Toxins in Food And Feed* (CXS 193-1995),
- *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related for Foods*(CXG 21-1997),
- *Recommended Methods of Analysis and Sampling* (CXS 234-1999),
- *Practice Concerning Source Directed Measures to Reduce Contamination of Food with Chemicals* (CXC 49-2001).

8. Identification of Any Requirement for and Availability of Expert Scientific Advice

None is required.

9. Identification of Any Need for Technical Input to the Standard from External Bodies so that this can be Planned for

None is required.

10. The Proposed Time-Line for Completion of the New Work.

The new work proposal has been submitted to the 44th Session of the Codex Alimentarius Commission for discussion in November 2021, it is agreed that the proposal will be submitted to the Codex Committee on Food Additives (CCFA) for discussion in March 2023, according to the Codex work process for developing standards, it is estimated that it will take about 5 years.

Procedures	Date
Agreement of the 44 th Session of the CAC to discuss the proposal in CCFA	2021
Discuss the proposal on the 53 rd Session of the CCFA	2023
Preparation of draft standard and circulation for comments	2023-2024
Consideration of the Proposed Draft in the relevant committee	2024
Adoption of the Proposed Draft by the CAC (Step 5)	2024
Consideration of the Draft Standard in the relevant committee	2025
Final Adoption of the Global Standard by the CAC (Step 8)	2025

DRAFT CODEX STANDARD FOR YEAST**1. SCOPE**

This standard applies to yeast products for baking, brewing and other purposes, both for direct sale to the consumer and for food manufacture. Yeast is used in the manufacture of baked goods and the production of alcoholic beverages. Subject to the provisions of this standard more specific requirements for special needs may be applied.

2. DESCRIPTION**2.1 Product definition**

Baker's yeast is taxonomically designated as *Saccharomyces cerevisiae*, a unicellular fungus, and the different strains can have different characteristics.

Fresh baker's yeast is obtained by dehydrating and forming or obtained by separating and washing cultures baker's yeast in the edible carbohydrate medium.

Dry baker's yeast is obtained by removing water from fresh baker's yeast and then dried to a low water content to stop the metabolic activity.

Brewer's yeast is the strains of yeast which include the enzyme α -galactosidase are used in the anaerobic fermentation process, which converts sugar into ethanol, and are commonly referred to as brewer's yeast.

Edible yeast is used in food processing, which can be used directly as food or as food ingredients to be added to various kinds of food to increase food flavor, nutrition and other functions

2.2 TYPES

Yeast can be categorised in four types:

2.2.1 BAKER'S YEAST**2.2.1.1 FRESH BAKER'S YEAST**

Fresh baker's yeast is milky white to yellowish brown solid or liquid with a characteristic scent and may be in three major forms:

- a) Block or compressed yeast which shall be in the form of a block. The texture or consistency shall be either high plasticity (kneadable, deformation possible without breakage) or friable/crumblly (blocks easily broken into small pieces);
- b) Granulated (crumbled) yeast which shall be in the form of small granules; or
- c) Liquid yeast which shall be a liquid suspension of yeast cells in water with a cream-like viscosity.

2.2.1.2 DRY BAKER'S YEAST

Dry baker's Yeast is yellow to brown or generally ivory powder, granule, or flakes with a characteristic scent and may be either;

- a) dry yeast is rehydrated to reactivate it in lukewarm water before use, the particles are usually spherical and 0.2 – 3 mm in diameter;
- b) instant yeast/instant dry yeast is dried in such a way that a rehydration step in water is no longer necessary that can be added directly to the flour, the product consists of porous cylindrical particles with a diameter of about 0.5 mm and length up to a few millimeters;

2.2.2 BREWER'S YEAST

Brewer's Yeast it is refers to the yeast producing carbon dioxide and alcohol, used for liquor, beer, wine, rice wine, fruit wine and other beverage wine and alcohol fermentation.

2.2.3 EDIBLE YEAST

Edible yeast contains protein, amino acids and other nutrients, and can be used as a food ingredient to increase nutrition.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 FERMENTATION ACTIVITY

Fermentation activity is the most critical characteristic of yeast. It is the ability of yeast to produce carbon dioxide by using external nutrient source is an index to measure the fermentation performance of yeast, included fresh baker's yeast and dry baker's yeast.

3.2 ALCOHOLIC RATE FROM FERMENTATION STARCH

At a certain temperature, the quantity of alcohol produced by fermentation of the quantity of corn meal acid in a specified time is the percentage of starch, which is the index to measure the fermentation performance of brewer's yeast.

3.3 MOISTURE

The moisture content of fresh baker's yeast, dry baker's yeast, brewer's yeast and edible yeast has a wide range, depending on the formulation of the product-block yeast, granulated yeast, liquid yeast-and the requirements for fermentation performance and consistency/friability.

3.4 NITROGEN

The nitrogen content on dry matter typically has a value for fresh baker's yeast, dry baker's yeast, brewer's yeast and edible yeast.

3.5 ASHES

The inorganic material that remains after food is burned is called ash. The ash content on dry matter for yeast is to control products quality.

3.6 pH

The typical pH in order to limit the pH of the product, included fresh baker's yeast, dry baker's yeast, brewer's yeast and edible yeast

3.7 Quality assurance

The production of baker's yeast shall only be performed by reliable manufacturers having the knowledge and the equipment requisite for the adequate production of baker's yeast, and specifically, for the correct dosage and even intermixing.

4. FOOD ADDITIVES

Food additives listed in Tables 1 and 2 of the Codex *General Standard for Food Additives* (CXS 192- 1995) in Food Category 12.8 (Yeast and like products) may be used in foods subject to this standard.

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the Codex *General Standard for Contaminants and Toxins in Food and Feed* (CXS 193-1995).

6. HYGIENE

6.1 It is recommended that the product covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *General Principles of Food Hygiene* (CXC 1-1969), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

6.2 The products should comply with the microbiological criteria established in accordance with the *Principles and Guidelines for the Establishment and Application of Microbiological Criteria related to Foods* (CXG 21-1997).

7. LABELLING

In addition to the requirements of the Codex *General Standard for the Labelling of Pre-packaged Foods* (CXS 1- 1985) the following specific provisions apply:

7.1 THE NAME OF THE PRODUCT

The name and type of the product. For example, "Fresh Baker's Yeast", "Dry Baker's Yeast", "Brewer's Yeast" and "Edible Yeast".

7.2 LABELLING OF NON-RETAIL CONTAINERS

Information for non-retail containers shall either be given on the container or in accompanying documents, except that the name of the product, lot identification and name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or

packer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. PACKAGING, TRANSPORTATION AND STORAGE

The packaging must not be a source of contamination or migration, should be food grade and must protect the product quality during transportation and storage. It must be free from off odours.

9. METHODS OF ANALYSIS AND SAMPLING

9.1 Methods of analysis

Provision	Method	Principle
Fermenting activity	See Annex I	See Annex I
Alcoholic rate from fermentation starch	See Annex II	See Annex II
Moisture	AOAC 961.06	Gravimetry
Nitrogen	ISO 1871-2009	Kjeldahl method
Ashes	ISO 928-1997	Gravimetry
pH	ISO 11289-1993	Potentiometric method

9.2 Methods of sampling

Representative samples for the products shall be drawn in accordance with CAC/GL 50.

METHOD FOR THE SAMPLING OF YEAST FOR THE DETERMINATION OF FERMENTING ACTIVITY**1. SCOPE**

This method applies to baker's yeast, included fresh baker's yeast and dry baker's yeast.

2. FIELD OF APPLICATION

This method applies to yeast products for baking.

3. PRINCIPLE

The volume of carbon dioxide gas produced by yeast fermentation of dough prepared with certain ingredients was measured at $30\text{ °C} \pm 0.2\text{ °C}$ for a specified period of time.

4. DEFINITIONS**5. EQUIPMENT****6. PROCEDURE****7. ACCEPTANCE CRITERION****8. SAMPLING REPORT**

Annex II**METHOD FOR THE SAMPLING OF YEAST FOR THE DETERMINATION OF ALCOHOLIC RATE FROM FERMENTATION STARCH****1. SCOPE**

This method applies to brewer's yeast.

2. FIELD OF APPLICATION

This method applies to yeast products for brewing.

3. PRINCIPLE

At a certain temperature, the quantity of alcohol produced by fermentation of the quantity of corn meal acid in a specified time is the percentage of starch, which is the index to measure the fermentation performance of brewer's yeast.

4. DEFINITIONS**5. EQUIPMENT****6. PROCEDURE****7. ACCEPTANCE CRITERION****8. SAMPLING REPORT**

—