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Paocai (salted fermented vegetables) — Specification and test methods

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents shall be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

Introduction

PAOCAI(salted fermented vegetables) is a representative of traditional fermented vegetables product, rich in organic acids, amino acids and other nutrients. It is recognized as being conducive to human health and becomes the world's recognized healthy fermented vegetable products, generally welcomed worldwide.

PAOCAI has a long history of production. It was introduced to Europe in the 17th century. Nowadays, it sells well all over the world, especially in countries and regions where PAOCAI is consumed such as China, Japan, Korea, and Europe, while the PAOCAI industry is accordingly developed rapidly. The market demand is enormous and the industry is accompanied by dramatic capacity expansion. However, with the rapid development, the lack of unified and explicit product quality and safety guarantees greatly limit the international trade and circulation of PAOCAI products.

In order to specify the properties of PAOCAI, and to prevent barriers to trade and communication, this international standard develops.

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Paocai (salted fermented vegetables) — Specification and test methods

1 Scope

This international standard describes the categories of PAOCAI (salted fermented vegetables), specifies the sensory, physical and chemical, safety, as well as labelling, transport and storage requirements of PAOCAI, and describes the corresponding test methods.

This international standard applies to vegetable products made of vegetables as main raw materials through soaking fermentation with added salt or saline solution 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.

ISO 750, *Fruit and vegetable products — Determination of titratable acidity*

ISO 2447, *Fruit and vegetable products — Determination of tin content*

ISO 3634, *Vegetable products — Determination of chloride content*

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

ISO 6633, *Fruits, vegetables and derived products — Determination of lead content — Flameless atomic absorption spectrometric method*

ISO 6888-1, *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*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

AOAC 968.30 *Canned Vegetables-Drained Weight Procedure*

CXS 1-1985, General Standard for the Labelling of Prepacked Foods

CXS 192-1995, General Standard for Food Additives

CXS 193-1995, General Standard for Contaminants and Toxins in Food and Feed

CXG 90-2017, Guidelines on Performance Criteria for Methods of Analysis for the Determination of Pesticide Residues in Food and Feed

CODEX ONLINE PESTICIDES DATABASE C.A.C., Available at <http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/>

3 Terms and definitions

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

3.1
PAOCAI
Salted fermented vegetable products made of vegetables such as cabbage, mustard stems, long beans, peppers, daikon, carrots and other kinds of vegetables, through soaking fermentation with added salt or saline solution before sterilization or non-sterilization, seasoning or not seasoning.

3.2
Soaking fermentation
Process of vegetables with its inherent flavour formed through lactic acid bacteria-based fermentation which is carried out by immersing vegetables into saline solution. The saline solution can be directly made with salt and water or with the leaching water of salted vegetables.

3.3
Salinity
Content of sodium chloride when salt in vegetables is balanced with that in saline solution in the process of soaking fermentation

4 Classification

According to the process and technology, PAOCAI are classified into sterilized and non-sterilized. The temperature and duration of sterilization process depend on the content of products and limits of target microorganisms.

5 Product requirements

5.1 Sensory requirements

5.1.1 Colour

PAOCAI products shall be of inherent colour of this kind of product.

5.1.2 Flavour

PAOCAI products shall be of the inherent flavour and smell of this kind of product, without smell.

5.1.3 Texture

PAOCAI products shall be crisp, tender, hard and brittle, without having the signs of deterioration and rotting.

5.1.4 Appearance

PAOCAI vegetables shall be used as whole or cut into various patterns such as strip, sheet, diced shape or irregular shape, without mildew white film layer.

5.1.5 Impurities

No external impurities shall be seen with naked eyes.

5.2 Physical and chemical requirements

The physical and chemical requirements to PAOCAI products shall meet the requirements of [Table 1](#).

Table 1 — Physical and Chemical Requirements

Indicator	Limit
Ratio of filtration mass to net mass*	≥50%
Titration acidity (Measured with lactic acid) (g/100g)	0.2-2.5
Salinity (Calculated as sodium chloride) (g/100g)	0.5-10.0

* Solid-Liquid Two Phase

5.3 Limits of microorganisms

The specification will specify the limits for coliform bacteria and *Staphylococcus aureus* in PAOCAI products.

Table 2 — Microbial Limits Requirements

Index	Sampling Inspection Plan		Limits			
	n	c	Sterilized		Non-sterilized	
			m(CFU/g)	M(CFU/g)	m(CFU/g)	M(CFU/g)
Coliform Bacteria	≤5	≤2	0	—	≤1000	≤10000
<i>Staphylococcus aureus</i>	≤5	≤2	0	—	≤1000	≤10000

- n: number of sample units; - c: the maximum allowable number of defective sample units in a 2-class plan or marginally acceptable sample units in a 3-class plan; - m: a microbiological limit which, in a 2-class plan, separates good quality from defective quality or, in a 3-class plan, separates good quality from marginally acceptable quality; - M: a microbiological limit which, in a 3-class plan, separates marginally acceptable quality from defective quality.

5.4 Limits of food additives

If added, the limits of food additives in PAOCAI products, shall comply with requirements in the CXS 192-1995.

5.5 Limits of heavy metals

Tested according to the test methods in ISO 6633 and ISO 2447, the limits of heavy metals in PAOCAI products shall comply with requirements in the CXS 193-1995.

5.6 Limits of pesticide residue

Tested according to the method of CXG 90-2017, the limits of pesticide residue shall comply with maximum residue limits of pesticide specified in the CAC Codex Online Pesticides Database, available at: <http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/>.

6 Sampling and test methods

6.1 Sampling

Samples are taken from the lot. Products with the same group, class, size, packaging and same inspection time is considered as a lot. Sampling shall be done according to ISO 2859- 1.

6.2 Sensory inspection

Take a moderate amount of samples, place them in clean white disks, observe their color, texture and impurities with naked eyes under sufficient natural light, and finally smell their odor and taste the taste.