

PHILIPPINE NATIONAL STANDARD

PNS/BAFPS 22:2007
ICS 67.200.10

Virgin coconut oil (VCO)



BUREAU OF PRODUCT STANDARDS

Foreword

The Philippine National Standard (PNS) for Virgin Coconut Oil (VCO) was established and was adopted in 2004. Since its adoption, major industry players move for its immediate revision. In relation to this, studies were commissioned in order to support the provisions of the standards.

PNS/BAFPS 22:2004 is hereby revised in order to reflect the results of the studies conducted on VCO. The revised standard provides a common language for the essential composition and quality factors, specifically the identity and quality characteristics.

This standard cancels and replaces PNS/BAFPS 22:2004 and its Amendment 1:2005.

Virgin coconut oil (VCO)

1 Scope

This standard applies to virgin coconut oil in a state for human consumption.

2 References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3 Definitions

For the purpose of this standard, the following definitions apply:

3.1 General**3.1.1****free fatty acids (FFA)**

a specified fatty acid liberated by hydrolysis from naturally occurring fats

3.1.2**glyceride**

an ester formed by the combination of glycerol and fatty acid. Glycerides occur naturally in oils and fats

3.1.3**virgin coconut oil (VCO)**

oil obtained from the fresh, mature kernel of the coconut by mechanical or natural means, with or without the use of heat, without undergoing chemical refining, bleaching or deodorizing, and which does not lead to the alteration of the nature of the oil. Virgin coconut oil is an oil which is suitable for consumption without the need for further processing

Virgin coconut oil (VCO) consists mainly of medium chain triglycerides, which are resistant to peroxidation. The saturated fatty acids in VCO are distinct from animal fats, the latter consisting mainly of long chain saturated fatty acids.

4 Essential composition and quality factors

4.1 Identity characteristics

4.1.1 Gas liquid chromatography (GLC) ranges of fatty acid composition shall be in accordance with Table 1.

Table 1 – Gas liquid chromatography range of fatty acid composition

Common name	Composition	(%)
Caproic acid	C 6:0	0.1 – 0.7
Caprylic acid	C 8:0	4.0 – 10.0
Capric acid	C 10:0	4.0 – 8.0
Lauric acid	C 12:0	45.1 – 56.0
Myristic acid	C 14:0	16.0 – 21.0
Palmitic acid	C 16:0	7.5 – 10.2
Stearic acid	C 18:0	2.0 – 5.0
Oleic acid	C 18:1	5.0 – 10.0
Linoleic acid	C 18:2	1.0 – 2.5

4.2 Quality characteristics

4.2.1 Color, odor and taste

Virgin coconut oil shall be colorless, sediment free, with natural fresh coconut scent and free from rancid odors or tastes.

4.2.2 Virgin coconut oil shall conform to the requirements specified in Table 2.

Table 2 – Virgin coconut oil property requirements

Properties	Maximum Level
% Moisture content (w/w)	≤ 0.10
% Matter volatile at 120 °C (w/w)	0.12 – 0.20
% Free fatty acids (expressed as lauric acid)	0.20
Peroxide value, meq/kg oil	3.0
Food additives	None permitted

5 Contaminants

Table 3 – Allowable levels of contaminants in virgin coconut oil (VCO)

Specifics	Maximum level
Heavy metal, mg/kg, max.	
Iron (Fe)	5.0
Copper (Cu)	0.40
Lead (Pb)	0.10
Arsenic (As)	0.10

6 Hygiene

It is recommended that the product covered by the provisions of this standard shall be in accordance with the appropriate Sections of the General Principle of Food Hygiene recommended by the Codex Alimentarius Commission (CAC/RCP 1-1969, Rev.3-1997).

The total aerobic microbial count does not exceed 100 cfu per mL, the total combined molds and yeasts count does not exceed 10 cfu per mL, and it meets the requirements of the tests for absence of *Salmonella* species and *Escherichia coli*.

7 Packaging

Virgin Coconut Oil (VCO) should be packed in any suitable and food grade container that can withstand transportation, handling and storage conditions.

8 Labelling

The label of each package shall have the following information:

1. Name of product: “Virgin coconut oil”;
2. Brand name or trade name;
3. Net content;
4. Lot identification;
5. Name and address of the manufacturer and/or packer, or distributor;
6. The phrase “Product of the Philippines”;
7. Type of Process (see Annex);
8. Date manufactured and “Best Before”; and
9. BFAD registration number and bar code (optional).

9 Methods of analysis and sampling

9.1 Determination of fatty acid composition

According to IUPAC 2.301, 2.302 and 2.304 or ISO 5508:1999 and ISO 5509:1999.

9.2 Determination of Moisture Content

According to AOAC 984.20 (Karl Fisher Method).

ANNEX

Type of production processes recognized by the Philippine Coconut Authority (PCA) on the Production of Virgin Coconut Oil (VCO) as per PCA Administrative Order No. 01 series of 2005

Implementing Rules and Regulations to Enforce Standards in the Production and Marketing of Virgin Coconut Oil (VCO)

Section V. Production Processes

Producers/processors shall state in their product label sufficient information to identify the process used in the production of virgin coconut oil, such as traditional process (latik), fermentation with heat, fermentation without heat, centrifuge process, expelling process (with or without cooling system), or equivalent process which ensures that the product conforms with the definition and chemical and physical characteristics in the Philippine Virgin Coconut Oil Standards herein adopted.

References

PNS/BAFPS 22:2007

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.

AOAC 984.20. Karl Fisher Method

Codex Alimentarius Commission, Recommended International Code of Practice General Principles of Food Hygiene. CAC/RCP 1-1969 (Rev. 4-2003 1)

Codex Standard for Olive Oil, Virgin and Refined, and for Refined Olive-Pomace Oil, Codex Stan 33-1981 (Rev.1-1989)

Codex Standard for Edible Fats and Oils Not Covered by Individual Standards. Codex Stan 19-1981 (Rev. 2-1999)

Codex Standard for Named Vegetable Oils. Codex Stan 210-1999

CYB Group Plc: Glossary of Terms. <http://www.cybgroup.co.uk>

Dayrit, F.M., Buenafe, E.M., Chainani, E.T., de Vera, I.S., Dimzon, I.D., Gonzales, E.G., and Santos, J.R. 2006. Standards for Essential Composition and Quality Factors of Commercial Virgin Coconut Oil. National Chemistry Instrumentation Center, Department of Chemistry, Ateneo de Manila University.

Fennema O.R. Food Chemistry 2nd Edition: Revised and Expanded, Marcel Dekker, Inc.: New York

Gonzales, L. A. 2004. Assessment and Development of Quality Standards for Virgin Coconut Oil Produced From Different Processes. PQCRD: Philippine Coconut Authority

ISO 5508:1999 Animal and vegetable fats and oils -- Analysis by gas chromatography of methyl esters of fatty acids

ISO 5509:1999 Animal and vegetable fats and oils -- Preparation of methyl esters of fatty acids

Kokonut Pacific: Oil composition and quality factors. <http://www.kokonutpacific.com.au>

Nielsen, S.S. Introduction to the Chemical Analysis of Foods. Jones and Bartlett

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The use of the PS Certification Mark is governed by the provisions of Department Administrative Order No. 01 series of 1997 – Revised Rules and Regulations Concerning the Philippine Standard (PS) Quality and / or Safety Certification Mark Scheme by the Bureau of Product Standards. This mark on a product/container is an assurance by the manufacturer/producer that the product conforms with the requirements of a Philippine standard. Details of conditions under which a license to use the PS Certification Mark may be granted can be obtained from the Bureau of Product Standards, Department of Trade and Industry, 361 Sen. Gil J. Puyat Avenue, Makati City.



Department of Agriculture
Bureau of Agriculture and Fisheries Product Standards
Technical Working Group for the Revision of the Philippine National Standard for
Virgin Coconut Oil (VCO)
Department of Agriculture Special Order No. 169 series of 2006

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