



**JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON FATS AND OILS
Twenty-Sixth Session**

Kuala Lumpur, Malaysia, 25 February- 01 March 2019

**DISCUSSION PAPER ON THE INCLUSION OF FREE FATTY ACIDS AS QUALITY CHARACTERISTICS
CRITERIA FOR REFINED RICE BRAN OILS (CXS 210-1999)**

(Prepared by Thailand)

BACKGROUND

1. At the 25th Session of the Codex Committee on Fats and Oils (CCFO), Thailand presented a discussion paper¹ for the inclusion of free fatty acid as quality characteristics criteria for refined rice bran oils on the *Codex Standard for Name Vegetables Oil* (CXS 210-1999).
2. Thailand explained that in refined rice bran oil the most critical quality parameter was free fatty acids and or acid value and that these two parameters were currently being used in trade. However, in the *Codex Standard for Named Vegetable Oils* (CXS 210-1999) only acid value was listed as the parameter for determination of the acidity of refined rice bran oil. To reflect the current industry and trade practice of rice bran oil, Thailand proposed to amend Appendix 1 to include: free fatty acid for refined rice bran oil (under quality characteristics) and a method for determination of acidity (under methods of analysis).
3. In view of general support, the Committee requested Thailand to prepare a discussion paper including a project document based on the guideline on the application of the Criteria for the establishment of work priorities in the Procedural Manual, for consideration at its next Session².

INTRODUCTION

4. Oil extracted from layer between the white rice and the paddy husk is known as rice bran oil. It is an edible oil used as an excipient in food, industry. Global rice bran oil market size was estimated at over 1.7 million tons in 2017. The abundant raw material availability in the form of rice particularly in Asian countries is the reason for higher production volumes of rice bran oil in these countries. The major producer was India (1,000,000 tons), China (440,000 tons) and Thailand (134,000 tons).
5. Free fatty acids (FFA) or acid value is one of the most critical quality parameters of rice bran oils. High FFA will lead to hydrolytic rancidity and affect quality of the oils.

Table 1 National standards and requirement of acid value (AV) and FFA of refined vegetable oil

Country	Acid Value (max, mg KOH/g)	% FFA (max)
Codex	0.6	-
China	3	1.5
India	0.5	0.25
Korea	0.6	0.3
Thailand	0.6	-
Vietnam	0.6	0.3

Source: Global Rice Bran Oil Conference 2015, 7-8th August 2015, Mumbai, India,

¹ FO25 CRD19

² REP17/FO.Rev paras 90.91

6. Current reference method of analysis for acid value and FFA based on acid-base titration are shown in Table 2

Table 2 Reference method of analysis for acid value and FFA

Organization	Acid value (mg KOH/g)	Free fatty acid (%)
American Oil Chemists' Society (AOCS)	AOCS Cd 3d-63(03)	AOCS Ca 5a-40
International Standard Organization (ISO)	ISO 660:2009	
Internal Union of Pure and Applied Chemistry (IUPAC)	-	IUPAC 2.201

Source: Global Rice Bran Oil Conference 2015, 7-8th August 2015, Mumbai, India,

ISSUES

7. Acidity of refined vegetable oil in *Standard for Named Vegetables Oils* (CXS 210-1999) is expressed as acid value and reference method for the determination of acid value are ISO 660:2009 and AOCS Cd 3d-63(03). The acidity expressed as acid value or free fatty acid (FFA) are used in trade practice of refined rice bran oil, and method of analysis for acid value and free fatty acid both available in national standards, regulation and trade practices are based on acid-base titration. In case of FFA, AOCS Ca 5a-40 is used and express as %FFA as oleic acid.

8. To reflect the current practice of rice bran oil industries and harmonizing requirements for acidity of refined rice bran oil, FFA content express as % FFA as oleic acid and method of analysis of FFA of AOCS Ca 5a-40 (revised 2012) should be included in the *Codex Standard for Named Vegetables Oils* (CXS 210-1999).

PROPOSAL

9. The proposed amendments will focus on the Appendix of CXS 210-1999, especially the following sections

- a) Section 1: Quality Characteristics - include a proposed value of the FFA content of refined rice bran oil, expressed as oleic acid
- b) Section 5: Methods of Analysis and Sampling – Include a method of analysis of FFA - according to AOCS Ca 5a-40

The proposed amendment is not intended to replace the existing acid value in the standard, but to add the specification of FFA in refined rice bran oil and provide a method for analyzing the FFA content as currently practiced in the international trade.

CONCLUSION

10. The Committee is invited to consider the proposal and recommend to the 42nd Session of the Codex Alimentarius Commission to approve new work for the Inclusion of Free Fatty Acid as Quality Characteristics Criterial for Refined Rice Bran Oil (CXS 210-1999).

11. The Project Document for Proposal of New Work for the Inclusion of Free Fatty Acid as Quality Characteristics Criterial for Refined Rice Bran Oil (CXS 210-1999) is attached as Appendix.

PROJECT DOCUMENT

The Inclusion of Free Fatty Acid as Quality Characteristics Criterial for Refined Rice Bran Oil (CXS 210-1999)

1. Purposes and scope of the Standard

The purpose and scope of the proposed amendment to the *Standard for Named Vegetables Oils* (CODEX STAN 210-1999) is to include free fatty acid (FFA) as oleic acid for refined rice bran and consequentially to include Method of Analysis for FFA in the Appendix of Standard.

2. Relevance and timeliness

Refined rice bran oil is vegetable oil which can be produce by chemical and physical refining. For chemical refining process, crude rice bran oil is refined by the process of neutralization with alkali, bleached with bleaching earth or activated carbon, or both, a deodorized with steam where as physical refining, free fatty acid will be removed by steam stripping.

Rice bran oil is one of major commercial edible vegetable oil. It is rich in many neutraceutical compounds such as Gamma Oryzanol (γ -Oryzanol), lecithin, tocopherols and tocotrienols etc. Major producing countries are such as Thailand, India, China and Japan. Annual global potential of refined rice bran oil is estimate 1.2 Million Metric tons.

Free fatty acids (FFA) or acid value is one of the most critical quality parameters of rice bran oils. High FFA will lead to hydrolytic rancidity and affect quality of the oils.

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Source: Global Rice Bran Oil Conference 2015, 7-8th August 2015, Mumbai, India,

Current reference method of analysis for acid value and FFA based on acid-base titration are shown in Table 2.

Table 2 Reference method of analysis for acid value and FFA

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Source: Global Rice Bran Oil Conference 2015, 7-8th August 2015, Mumbai, India,

Acidity of refined vegetable oil in *Standard for Named Vegetables Oils* (CODEX STAN 210-1999) is expressed as acid value and reference method of acid value are ISO 660:2009 and AOCS Cd 3d-63(03). The acidity expressed as acid value or free fatty acid are used in trade practice of refined rice bran oil and method of analysis for acid value and free fatty acid both available in national standards, regulation and trade practices are based on acid-base titration. In case of FFA, AOCS Ca 5a-40 is used and express as %FFA as oleic acid.

To reflect the current practice of rice bran oil industries and harmonizing requirements for acidity of refined rice bran oil, FFA content express as % FFA as oleic acid and method of analysis of FFA of AOCS Ca 5a-40 (revised 2012) should be included in the *Standard for Named Vegetables Oils* (CODEX STAN 210-1999).

3. Main aspects to be covered

The proposed amendments will include a value of the FFA content of refined rice bran oil, expressed as oleic acid under the section *Quality Characteristics*, and method of analysis of FFA of AOCS Ca 5a-40 under the section *Methods of Analysis and Sampling* in the Appendix of the Standard for Named Vegetables Oil (CXS 210-1999). as indicated below:

APPENDIX**OTHER QUALITY AND COMPOSITION FACTORS****1. QUALITY CHARACTERISTICS**

	<u>Maximum level</u>
Acidity	
Acid value	
Refined oils	0.6 mg KOH/g Oil
Cold pressed and virgin oils	4.0 mg KOH/g Oil
Virgin palm oils	10.0 mg KOH/g Oil
<u>Free fatty acid</u>	
Refined Rice bran oil	<u>0.3 % (as oleic acid)</u>

5. METHODS OF ANALYSIS AND SAMPLING

Determination of acidity

- According to ISO 660: 1996, amended 2003; or AOCS Cd 3d-63 (03)
- According to AOCS Ca 5a-40 (for FFA)

4. Assessment against the Criteria for the establishment of work priorities

Criteria applicable to commodities

General Criterion**Consumer protection from the point of view of health, food safety, ensuring fair practices in the food trade and taking into account the identified needs of developing countries**

There are already provision in the *Standard for Named Vegetables Oils* (CODEX STAN 210-1999) to ensure consumer protection in terms in food safety and authenticity of these product. The new proposed revisions will serve to enhance international trade of rice bran oil and ensure the quality of the oil and consistency in global practices.

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

Global rice bran oil market size was estimated at over 1.7 million tons in 2017. The abundant raw material availability in the form of rice particularly in Asian countries is the reason for higher production volumes of rice bran oil in these countries. The major producers as indicated in Table 3 below.

Table 3 Production of crude rice bran oil

Country	Production of crude rice bran oil (tones)
1. India	1,000,000 ^a
2. China	440,000 ^a
3. Thailand	134,000 ^a
4. Bangladesh	90,000 ^b
5. Japan	65,000 ^a
6. USA	25,000 ^b
7. Vietnam	23,000 ^a
Total	1,770,000

Source ^a The 5th International Conference on Rice Bran Oil (ICRBO), 23-25 May 2018, Hanoi, Vietnam

^b The 4th International Conference on Rice Bran Oil (ICRBO), 24-25 August 2017, Bangkok, Thailand

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

The proposed revision in the *Standard for Named Vegetables Oils* (CODEX STAN 210-1999) would facilitate in the harmonization of national legislations with international standards and thus reduce impediments to international trade of rice bran oil.

(c) International or regional market potential

Rice bran oil is edible oil with multiple health benefits and needs to be promoted for its edible use. The consumption of rice bran oil is expected to rise in the coming years, due to increasing awareness among consumers regarding its health benefits and beneficial composition. The proposed work will serve to enhance international trade and regional market of rice bran oil and ensure the quality of the oil and consistency in global practices.

(d) Amenability of the commodity to standardization

The specification for acidity expressed in term FFA as oleic acid for rice bran oil has already been well-established in rice bran oil trade worldwide. Therefore, the proposed revision the Standard for Named Vegetable Oil (CXS 210-1999) will facilitate the harmonization of national legislations with international standards.

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

There are already provision in the existing Standard for Named Vegetables Oil (CXS 210-1999) that cover the main consumer protection and trade issues. The proposed revisions will provide further improvement to the standard and thus facilitate its implementation.

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

This item is not relevant to this proposal.

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

There is no other know international organization with have already undertaken this work.

5. Relevance to the Codex strategic objectives

This revision is consistent with Strategic Plan of the Codex Alimentarius Commission 2014-2019 to establish international food standard in response to needs identified by Members and in response to factors that affect food safety, nutrition and fair practices in the food trades.

6. Information on the relation between the proposal and other existing Codex documents

This proposal is a revision to the existing *Codex Standard for Named Vegetables Oil* (CXS 210-1999).

7. Identification of any requirement for and availability of expert scientific advice

No expert scientific advice from external bodies is necessary.

8. Identification of any need for technical input to the Standard from external bodies so that this can be planned for:

No technical input to the standard from external bodies is necessary.

9. Proposed date for adoption at Step 5, and the proposed date for adoption by the Commission; the time frame for developing a Standard should not normally exceed four year

- Approval as new work by the 42nd Session of Codex Alimentarius Commission in 2019.
- Proposed draft revision considered at step 4 at the 27th Session of CCFO, 2021.
- Final adoption at Step 5/8 in the 44th Session of Codex Alimentarius Commission in 2021.