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CRD19

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FATS AND OILS

25th Session

Kuala Lumpur, Malaysia, 27 February - 3 March 2017

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

(Prepared by Thailand)

INTRODUCTION

Refined rice bran oil is vegetable oil which can be produced 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, and deodorized with steam whereas physical refining, free fatty acid will be removed by steam stripping.

Rice bran oil is one of the major commercial edible vegetable oils. It is rich in many nutraceutical 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 estimated 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.

National standards and requirements of acid value (AV) and FFA of refined vegetable oil are as follows.

No.	Country	Acid value (Max, mgKOH/g)	%FFA (Max)
1.	Codex	0.6	-
2.	China	3	1.5
3.	India	0.5	0.25
4.	Korea	0.6	0.3
5.	Thailand	0.6	-
6.	Vietnam	0.6	0.3

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

Current reference methods of analysis for acid value and free fatty acid based on acid-base titration are as follows:

No.	Organization	Free fatty acid (%)	Acid value (mg OH/g)
1.	American Oil Chemists' Society (AOCS)	AOCS Ca 5a-40	AOCS Cd 3d-63(03)
2.	International Standard Organization (ISO)	ISO 660:2009	
3.	International Union of Pure and Applied Chemistry (IUPAC)	IUPAC 2.201	

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

ISSUES

Acidity of refined vegetable oil in CODEX STAN 210-1999 is expressed as acid value and reference methods 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 methods of analysis for acid value and free fatty acid both available in national standards, regulations and trade practices are based on acid-base titration. In case of FFA, AOCS Ca 5a-40 is used and expressed 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 CODEX STAN 210-1999.

PROPOSAL

Thailand proposes to add the expression of acidity with free fatty acid content for refined rice bran oil and method of analysis AOCS Ca 5a-40 (with Alkali blue 6B as an indicator for Refined rice bran oil) in Section 1 and 5 of Quality Characteristics of the Appendix of the Standard for Named Vegetable Oils(CODEX STAN 210-1999) as follows:

1. QUALITY CHARACTERISTICS

	Maximum level
<u>Acidity</u>	
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>	
<u>Refined Rice bran oil</u>	<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) and AOCS Ca 5a-40.