



## JOINT FAO/WHO FOOD STANDARDS PROGRAMME

### CODEX COMMITTEE ON FATS AND OILS

#### 25<sup>th</sup> Session

Kuala Lumpur, Malaysia, 27 February - 3 March 2017

### DISCUSSION PAPER ON THE REPLACEMENT OF ACID VALUE WITH FREE FATTY ACIDS FOR VIRGIN PALM OILS IN THE STANDARD FOR NAMED VEGETABLE OILS (CODEX STAN 210-1999)

(Prepared by Malaysia)

#### BACKGROUND

1. At the 24<sup>th</sup> Session of the Codex Committee on Fats and Oils (CCFO), Malaysia presented a discussion paper<sup>1</sup> for the replacement of acid value with free fatty acids for virgin palm oils in the *Codex Standard for Named Vegetable Oils* (CODEX STAN 210-1999).
2. The Delegation explained that under current trade practice, the main quality specification to characterize acidity for virgin palm oil was “free fatty acids (FFA)”, while in the *Standard for Named Vegetable Oils*, acidity of virgin palm oil was expressed as “acid value” and thus leading to trade problems. The Delegation clarified that the intention of the amendment was not to modify the current acid value but the way acidity was expressed. The Committee noted that the current acid value in the standard (i.e. 10.0 mg KOH/g Oil) was not equivalent to the FFA 5% (as palmitic acid), but it was the same FFA 5% (as oleic acid). Since FFA of palm oil is expressed as palmitic acid, being the major fatty acid of palm oil, there would be a mismatch of the acidity expressed as acid value of 10.00 mg KOH/g Oil with the specification of FFA 5% (as palmitic acid) currently being practiced in the international trade of palm oil. The Committee generally supported the proposal and also noted a suggestion to also include FFA for palm kernel oil. The Committee agreed that Malaysia would prepare a discussion paper including a project document, taking into account comments made at the present session for consideration at its next Session<sup>2</sup>.

#### INTRODUCTION

3. In 2015, the total world production of palm oil exceeded 62 million tonnes. This accounts to more than 30% of world production of 17 major oils and fats<sup>3</sup>. Malaysia is currently the second largest producer of palm oil and contributes to nearly 32% of global palm oil production behind Indonesia. In the same year, approximately 48.2 million tonnes of total palm oil produced globally was exported worldwide, with India, the European Union (EU), China and Pakistan being the major importers of palm oil. More than 61.09 million tonnes of palm oil was consumed worldwide in the same period<sup>4</sup>.
4. Palm kernel oil is one of two major lauric oil commodities traded internationally, the other being coconut oil. The total world production of palm kernel oil in 2015 stood at 6.85 million tonnes with Malaysia contributing to about 2.28 million tonnes. Approximately half of the total palm kernel oil produced worldwide is traded globally at 3.31 million tonnes<sup>5</sup>.
5. Virgin palm oil is derived from the fleshy mesocarp of the fruit of the oil palm (*Elaeis guineensis*). The oil is obtained through mechanical and physical extraction processes of oil palm fruit bunches<sup>6</sup>.
6. Crude palm kernel oil is obtained from the kernel of the fruit of the oil palm (*Elaeis guineensis*). The oil is also obtained through mechanical and physical extraction processes on the kernel within the oil palm fruit bunches<sup>6</sup>.

<sup>1</sup> FO/24 CRD/8

<sup>2</sup> REP15/FO paras 124-126

<sup>3</sup> Oil World Annual 2016

<sup>4</sup> Oil World Annual 2016

<sup>5</sup> Oil World Annual 2016

<sup>6</sup> Siew WL, Palm Oil, Vegetable oils in food technology: composition, properties and uses, ed. FD Gunstone, 2<sup>nd</sup> edition, 2011, pg 178-179

7. Acidity is defined as the content of FFA in an oil or fat determined according to the method specified in ISO 660:1996 or equivalent methods and is expressed as a percentage by mass of FFA. The expression of acidity varies according to the type of fat. For palm oil, the acidity is expressed as palmitic acid while for palm kernel oil, coconut oil and similar oils, the acidity is expressed as lauric acid<sup>7</sup>.

8. According to the AOCS Official Method Cd 3d-63, acid value is the number of milligrams of potassium hydroxide necessary to neutralize the FFA in 1 gram of test sample and is expressed in milligrams per gram. Acid value may be directly converted to percent FFA by means of a suitable factor. To express acid value in terms of FFA as percent lauric, oleic or palmitic, the acid value is divided by 2.81, 1.99 or 2.19, respectively<sup>8</sup>.

## ISSUES

### PALM OIL

9. In the current global palm oil trade practice, the acidity of virgin palm oil is expressed as maximum FFA content of 5% (as palmitic acid), with palmitic acid being the major fatty acid in palm oil. However, the acidity for virgin palm oil in the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) is currently expressed as acid value of 10.0 mg KOH/g Oil<sup>9</sup>. This acid value is equivalent to FFA 5% (as oleic acid) but not equivalent to FFA 5% (as palmitic acid). As Codex Standards serves as the main reference in the development of national legislation, this inconsistency has resulted in difficulties and impediment to global palm oil trade.

### PALM KERNEL OIL

10. Similarly, the trade practice for expressing acidity of palm kernel oil is maximum FFA content of 5% (as lauric acid)<sup>10</sup>. In view that the acid value of cold pressed and virgin oils in Section 1 - Quality Characteristics in the Appendix to the Standard is 4.0 mg KOH/g Oil, there is also a mismatch in the acid value for crude palm kernel oil if it falls under the acid value specified for cold pressed and virgin oils. This is because an acid value of 4.0 mg KOH/g Oil is not equivalent to FFA content of 5% (as lauric acid). This inconsistency has also created problems in the global trade of palm kernel oil.

## PROPOSAL

### PALM OIL

11. The proposed amendment to the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) for replacement of acid value with FFA for virgin palm oils is to be included in Other Quality and Composition Factors under Section 1 - Quality Characteristics in the Appendix to the Standard. It is proposed that the current form of expression for acidity for virgin palm oils expressed as acid value 10.0 mg KOH/g Oil be replaced with FFA of virgin palm oil expressed as FFA content of 5% (as palmitic acid).

### PALM KERNEL OIL

12. As for crude palm kernel oil, the proposed amendment to the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) is to be included in Other Quality and Composition Factors under Section 1 - Quality Characteristics in the Appendix to the Standard. It is proposed to include under acidity the FFA for crude palm kernel oil expressed as FFA content of 5% (as lauric acid).

13. The proposed amendments to be incorporated under the section **Quality Characteristics** in the Appendix of the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) is indicated as follows:

#### "APPENDIX

#### OTHER QUALITY AND COMPOSITION FACTORS

#### 1. QUALITY CHARACTERISTICS

	<u>Maximum level</u>
<b>1.7 Acidity</b>	
<b>Acid value</b>	
Refined oils	0.6 mg KOH/g Oil
Cold pressed and virgin oils	4.0 mg KOH/g Oil

<sup>7</sup> ISO 660:1996, Animal and vegetable fats and oil – Determination of acid value and acidity, 2<sup>nd</sup> edition

<sup>8</sup> AOCS Official Method Cd 3d-63 – Acid Value, Reapproved 2009

<sup>9</sup> CODEX STAN 210: 1999

<sup>10</sup> Ibrahim NA (2013), Characteristics of Malaysian Palm Kernel and Its Products, Journal of Oil Palm Research, Vol. 25(2), pg. 245-252

**Free fatty acids**

Virgin palm oil	5 % (as palmitic acid)
Crude palm kernel oil	5 % (as lauric acid)"

**CONCLUSIONS**

14. Given the substantial global trade volume of palm oil and palm kernel oil, there is an urgent need to update the current Standard to ensure standardisation of national legislation in global trade practices. The Committee is invited to consider the proposals in the discussion paper and recommend to the 40<sup>th</sup> Session of the Codex Alimentarius Commission to approve new work for the replacement of acid value with FFA for virgin palm oils (expressed as palmitic acid) and to include FFA for crude palm kernel oils (expressed as lauric acid) in the Codex Standard for Named Vegetable Oils (CODEX STAN 210-1999) as amendments to the Standard to facilitate international palm oil and palm kernel oil trade. These amendments will better reflect the current global practices in palm oil and palm kernel oil trade and promote harmonisation of national legislations with international standards. The project document is attached as Appendix I.

## PROJECT DOCUMENT

**Revision of the *Standard for Named Vegetable Oils* (Codex Stan 210-1999):  
Replacement of Acid Value with Free Fatty Acids for Virgin Palm Oil and Crude Palm Kernel Oil**

**1. Purpose and scope of the standard**

The purpose and scope of the proposed amendments to the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) is to replace acid value with free fatty acids (FFA) expressed as palmitic acid for virgin palm oil and to include FFA for crude palm kernel oil expressed as lauric acid in the Appendix to the Standard.

**2. Relevance and timeliness**

Palm oil is the largest produced, consumed and traded vegetable oil in the world while palm kernel oil is amongst the largest edible oils traded worldwide. The oils have been globally traded for the last five decades and are widely consumed in countries such as India, Europe, China, Indonesia, Malaysia and other parts of the world.

The global trade practices for characterising acidity as one of the main quality specifications of virgin palm oil and crude palm kernel oil has always been expressed in terms of the content of FFA. However in the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999), the acidity of virgin palm oil is currently expressed as acid value. As for the acidity of crude palm kernel oil, the current specification is 4.0 mg KOH/g oil. The inconsistency in the different expression terms of the acidity of virgin palm oil and crude palm kernel oil has resulted in difficulties in international trade.

Codex Standards have been accepted internationally as the main reference in the development of national legislations. Therefore, the proposed amendments will promote standardization and harmonization with national legislations, thus avoiding any impediments to the international trade of palm oil and palm kernel oil. Hence, it is imperative that Codex consider amending the parameter related to acidity and to replace the acid value with FFA expressed as palmitic acid for virgin palm oil and to include acidity of crude palm kernel oil expressed as FFA content as lauric acid in the Standard to avoid any disruption to trade.

**3. Main aspects that should be covered**

The amendments will include a proposed value for FFA content of virgin palm oils, expressed as palmitic acid and the inclusion of acidity for crude palm kernel oils, expressed as FFA content expressed as lauric acid to be incorporated under the section **Quality Characteristics** in the Appendix of the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) as indicated as follows:

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

	<u>Maximum level</u>
<b>1.7 Acidity</b>	
<b>Acid value</b>	
Refined oils	0.6 mg KOH/g Oil
Cold pressed and virgin oils	4.0 mg KOH/g Oil
<b>Free fatty acids</b>	
Virgin palm oil	5 % (as palmitic acid)
Crude palm kernel oil	5 % (as lauric acid)"

#### 4. An 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 provisions in the *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) to ensure consumer protection in terms of food safety and authenticity of these products. The new proposed amendments will serve to enhance international trade of palm oil and palm kernel oil to ensure consistency in global practices.

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

According to data published by the Oil World Annual, the total world production of 17 major oils and fats in 2015 amounted to 206.38 million tonnes<sup>11</sup>. Palm oil is the largest produced vegetable oil in the world. The global production of palm oil reached 62.56 million tonnes, representing 30% of the total world production of major oils and fats. This is followed by soybean oil (24%), rapeseed oil (13%) and sunflower oil (7%). Palm kernel oil is the fifth largest produced vegetable oil at 6.85 million tonnes, contributing to about 3% of total world production of oils and fats (Figure 1).

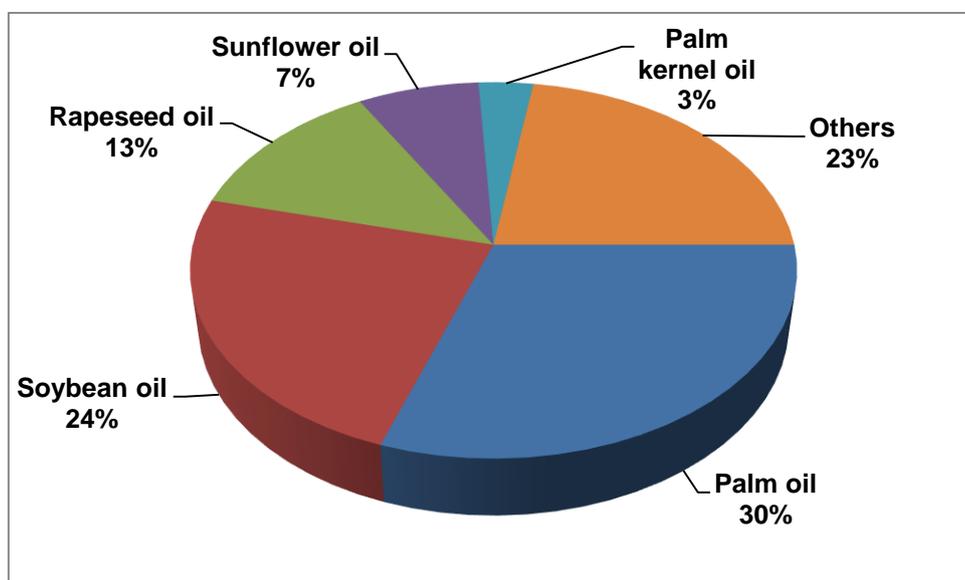


Figure 1. World production of major oils and fats in 2015

In 2015, more than 85% of total world production of palm oil and palm kernel oil were contributed by Indonesia (33.40 million tonnes) and Malaysia (19.96 million tonnes), the major producers of these oils. Other producers of palm oil and palm kernel oil include Thailand, Colombia, Nigeria, Ecuador and many other countries<sup>12</sup>.

In the same period, palm oil and palm kernel oil has been largely consumed worldwide by countries such as India, Indonesia, European Union (EU), China, Malaysia, Pakistan, Nigeria, Thailand, U.S.A., Colombia as well as many other countries. Table 1 tabulates the global consumption of palm oil while the worldwide consumption of palm kernel oil is shown in Table 2.

<sup>11</sup> Oil World Annual 2016

<sup>12</sup> Oil World Annual 2016

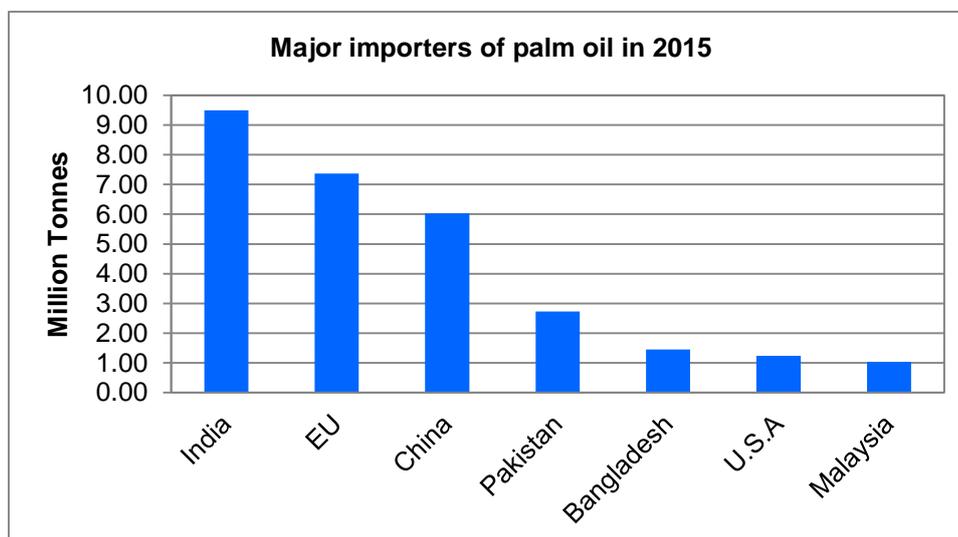
**Table 1. Worldwide consumption of palm oil in 2015<sup>13</sup>**

Country	Palm oil consumption (million tonnes)
India	9.29
Indon	7.34
EU	7.24
China	5.84
Malaysia	2.92
Pakistan	2.52
Others	25.94
<b>Total</b>	<b>61.09</b>

**Table 2. Worldwide consumption of palm kernel oil in 2015<sup>14</sup>**

Country	Palm kernel oil consumption (million tonnes)
Indonesia	1.68
Malaysia	1.50
EU	0.67
China	0.62
USA	0.27
Brazil	0.24
India	0.22
Others	1.52
<b>Total</b>	<b>6.72</b>

The major exporters of palm oil and palm kernel oil are Indonesia and Malaysia. In 2015, Indonesia and Malaysia exported a combined total of 44 million tonnes and 2.96 million tonnes of palm oil and palm kernel oil, respectively. Both oils are imported by more than 150 countries of which the major importers are India, EU, China, Pakistan, Bangladesh, U.S.A. and Brazil. Figure 2 illustrates the major palm oil importers in 2015 while Figure 3 shows the major importers of palm kernel oil in the same year.



<sup>13</sup> Oil World Annual 2016

<sup>14</sup> Oil World Annual 2016

Figure 2. Major importers of palm oil in 2015

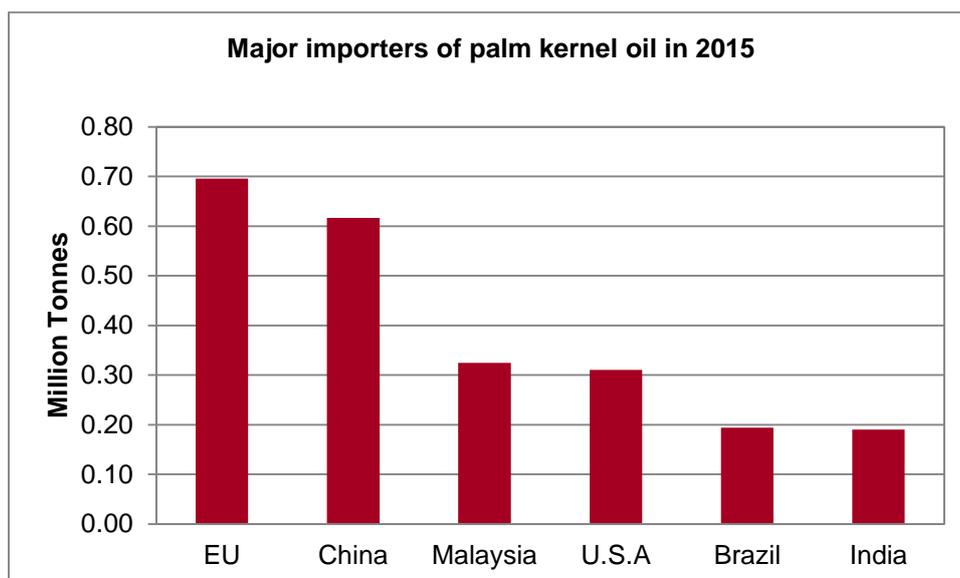


Figure 3. Major importers of palm kernel oil in 2015

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

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

**c) International or regional market potential**

There is existing substantial global trade volume of palm oil and palm kernel oil and this trend is expected to increase further in the future. In 2015, the world production of oils and fats was 206.38 million tonnes and palm oil and palm kernel oil constituted 30% and 3% of world production of main oils and fats, respectively. The global exports of palm oil in 2015 were 48.23 million tonnes, which constitutes about 57% of total world exports of main oils and fats. Approximately 3.31 million tonnes of palm kernel oil was exported worldwide in the same year.

**d) Amenability of the commodity to standardization**

The specification for acidity expressed in terms of FFA expressed as palmitic acid for palm oil and FFA expressed as lauric acid for palm kernel oil has already been well-established in palm oil and palm kernel oil trade worldwide. Therefore, the proposed amendments are suitable for standardization in the existing *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) to 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 provisions in the existing *Standard for Named Vegetable Oils* (CODEX STAN 210-1999) which cover the main consumer protection and trade issues. The proposed amendments will provide further improvement to the standard, in relation to the quality requirements to facilitate palm oil and palm kernel oil trade internationally.

**f) Number of commodities which would need separate standards indicating 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**

There is no other known international organisation which have already undertaken this work.

**5. Relevance to Codex strategic objectives**

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

**6. Information on the relation between the proposal and other existing Codex documents as well as other ongoing work**

This proposal is an amendment to the existing *Codex Standard for Named Vegetable Oils* (CODEX STAN 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. The proposed timeline for completion of the new work, including the start date, the proposed date for adoption at step 5, and the proposed date for adoption by the Commission**

Approval as new work by the 40<sup>th</sup> Session of the Codex Alimentarius Commission in July 2017;

Proposed draft amendments considered at Step 4 at the 26<sup>th</sup> Session of CCFO, February 2019.

Final adoption at Step 5/8 in the 42<sup>nd</sup> Session of the Codex Alimentarius Commission in July 2019.