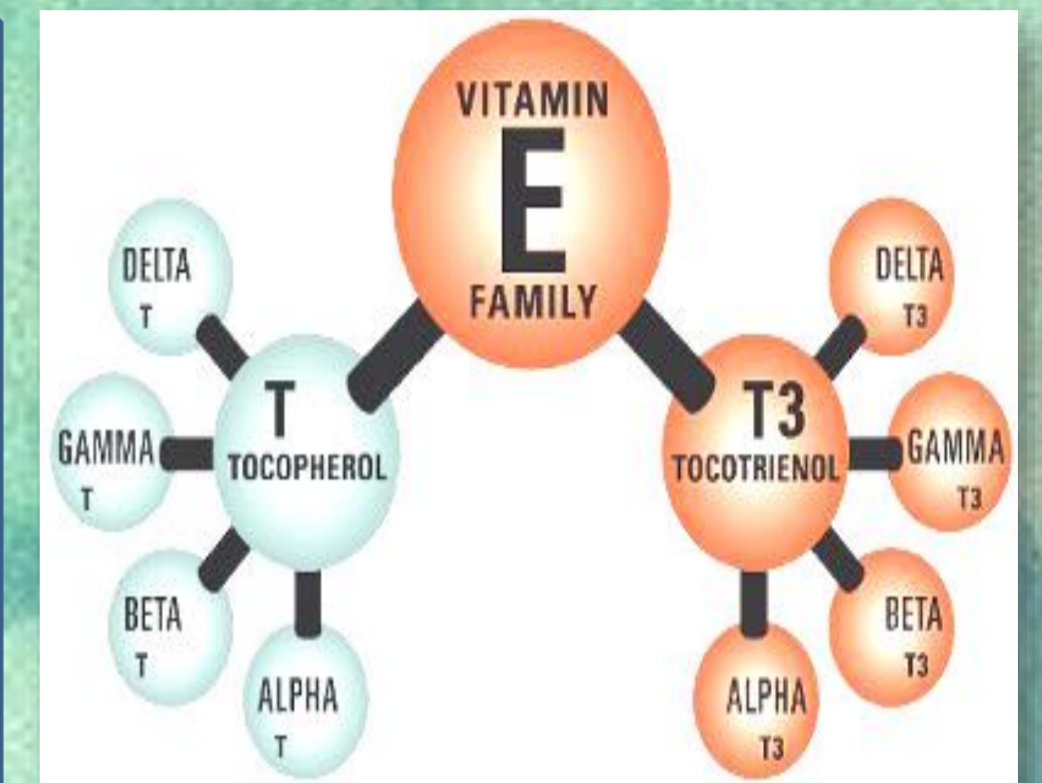


# PALM OIL: VITAMIN E

Yanty, N.A.M.<sup>1</sup>, Sarafhana, D.<sup>2</sup> and Nusantoro, B.P<sup>3</sup>

<sup>1</sup>Faculty of Food Science and Nutrition, Universiti Malaysia Sabah, Sabah, Malaysia, <sup>2</sup>Malaysian Palm Oil Council, Selangor, Malaysia and <sup>3</sup>Faculty of Agricultural Technology, Gadjah Mada University, Yogyakarta, Indonesia.

Vitamin E family includes eight chemically distinct molecules:  $\alpha$ -,  $\beta$ -,  $\gamma$ - and  $\delta$ -tocopherol; and  $\alpha$ -,  $\beta$ -,  $\gamma$ - and  $\delta$ -tocotrienol. Palm oil consists of various isomers of tocopherols (30%) and tocotrienols (90%) ( $\alpha$ -tocopherol,  $\alpha$ -tocotrienol,  $\gamma$ -tocopherol,  $\gamma$ -tocotrienol, and  $\delta$ -tocotrienol). Tocopherols are known as saturated, whereas the tocotrienols are unsaturated forms of vitamin E. Tocopherols differ from tocotrienols in that there are three double bonds in the side chain of the tocotrienols. There is a possibility that vitamin E isomers with only one or two double bonds in the side chain are present in palm oil. However, the quantity of vitamin E is found to be difference among oils derived from different parts and processes of palm. As a natural antioxidant, they play an important role in preserving an excellent stability and a longer shelf life effects on the palm oil products. Vitamin E also capable of reducing free radicals molecule in the body thus delaying the body's ageing process while help to protect human from certain chronic diseases. Nowadays, palm oil is one of the most widely used edible oil around the world that brings major nutritional attributes of vitamin E. Hence, the aim of this poster is to highlight the vitamin E content of crude palm oil, palm olein, refined palm oil, crude red palm oil, red palm oil, red palm olein, crude red palm olein, crude red palm stearin, low melting crude red palm stearin, high melting crude red palm stearin and palm fibre oil.



The content of vitamin E isomers (mg/kg) for different type of palm oils

Type of palm oil	Vitamin E isomers				
	$\alpha$ -tocopherol	$\beta$ + $\gamma$ - tocopherol	$\alpha$ -tocotrienol	$\beta$ + $\gamma$ - tocotrienol	$\delta$ -tocotrienol
CPO	420 $\pm$ 15 <sup>3</sup>	nd	260 $\pm$ 10 <sup>3</sup>	360 $\pm$ 10 <sup>3</sup>	80 $\pm$ 3 <sup>3</sup>
POL	179 <sup>6</sup>	17.6 <sup>6</sup>	219.9 <sup>6</sup>	340.8 <sup>6</sup>	67.0 <sup>6</sup>
RePO	158 <sup>2</sup>	nd	143 <sup>2</sup>	nd	86 <sup>2</sup>
CRPO	50.0 $\pm$ 0.71 <sup>4</sup> 106 $\pm$ 0.1 <sup>5</sup>	3.0 $\pm$ 0.07 <sup>4</sup> 11 $\pm$ 0.7 <sup>5</sup>	94.2 $\pm$ 0.14 <sup>4</sup> 161 $\pm$ 2.1 <sup>5</sup>	168.3 $\pm$ 1.41 <sup>4</sup> 401 $\pm$ 4.2 <sup>5</sup>	220.4 $\pm$ 1.41 <sup>4</sup> 188 $\pm$ 2.1 <sup>5</sup>
RPO	241 <sup>7</sup>	nd	119 <sup>7</sup>	252 <sup>7</sup>	116 <sup>7</sup>
RPOL	131.3 <sup>1</sup>	nd	190.0 <sup>1</sup>	nd	61.8 <sup>1</sup>
CRPOL	63.1 $\pm$ 0.14 <sup>4</sup>	5.1 $\pm$ 0.14 <sup>4</sup>	107.3 $\pm$ 0.35 <sup>4</sup>	175.4 $\pm$ 1.41 <sup>4</sup>	236.2 $\pm$ 1.41 <sup>4</sup>
CRPS	38.3 $\pm$ 0.35 <sup>4</sup>	2.0 $\pm$ 0.03 <sup>4</sup>	69.0 $\pm$ 0.35 <sup>4</sup>	55.1 $\pm$ 0.35 <sup>4</sup>	143.6 $\pm$ 0.70 <sup>4</sup>
LMCRPS	37.1 $\pm$ 0.35 <sup>4</sup>	1.0 $\pm$ 0.02 <sup>4</sup>	59.2 $\pm$ 0.35 <sup>4</sup>	56.2 $\pm$ 0.35 <sup>4</sup>	152.3 $\pm$ 0.70 <sup>4</sup>
HMCRPS	3.0 $\pm$ 0.21 <sup>4</sup>	nd	5.1 $\pm$ 10 <sup>4</sup>	7.0 $\pm$ 0.05 <sup>4</sup>	21.1 $\pm$ 0.10 <sup>4</sup>
PFO	1810 $\pm$ 10 <sup>3</sup>	nd	760 $\pm$ 15 <sup>3</sup>	930 $\pm$ 5 <sup>3</sup>	110 $\pm$ 5 <sup>3</sup>

<sup>1</sup>Al-Saqer et al., 2004; <sup>2</sup>Chong and Ng, 1991; <sup>3</sup>Han et al., 2004; <sup>4</sup>Kumar and Krishna, 2014; <sup>5</sup>Kumar et al., 2014; <sup>6</sup>Sundram et al., 2003; <sup>7</sup>Tepper et al., 2000. CPO= Crude Palm Oil, POL= Palm Olein, RePO= Refined Palm Oil, CRPO= Crude Red Palm Oil, RPO= Red Palm Oil, RPOL= Red Palm Olein, CRPOL= Crude Red Palm Olein, CRPS= Crude Red Palm Stearin, LMCRPS= Low Melting Crude Red Palm Stearin, HMCRPS= High Melting Crude Red Palm Stearin, PFO= Palm Fibre Oil and nd= not determined.

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