C 5

**LEMBAR**
**HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW***
**KARYA ILMIAH : JURNAL ILMIAH**

| | | |
|---|---|---|
| Judul Artikel Ilmiah | : | Virgin Coconut Oil (VCO) treatment to reduce the level of LOX-1 and Lp-PLA2: experimental study of high-fat diet on wistar rats |
| Penulis Artikel Ilmiah | : | Harti LB, Suprihati S. **Kristina, T.N.** |
| Status Pengusul | : | Penulis pertama/ **penulis anggota**/ penulis korespondensi |
| Identitas Jurnal Ilmiah | : | a. Nama Jurnal : International Food Research Journal<br>b. ISSN : 0125-5810<br>c. Volume/No/halama : 25/5/1925-1929<br>d. Edisi (bulan/tahun) : Oktober 2018<br>e. Penerbit : Faculty of Food Science & Technology , UPM<br>f. Jumlah halaman : 5<br>g. DOI (Jika ada) :<br>h. Alamat web Jurnal : http://www.ifrj.upm.edu.my<br>h. Terindeks di : Scopus, Q3, SJR:0,31 |
| Kategori Publikasi Jurnal Ilmiah<br>(beri ü pada kategori yang tepat) | : | [V] Jurnal Ilmiah Internasinal Bereputasi<br>[ ] Jurnal Internasional |

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| b. Ruang lingkup dan kedalaman pembahasan (30%) | 12 | 11,70 |
| c Kecukupan dan kemutahiran data dan metodologi (30%) | 12 | 11,60 |
| d. Kelengkapan unsur dan kualitas penerbit (30%) | 12 | 11,60 |
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| **Nilai pengusul :** | **( 0,4 X 38,5) / 2 = 7,70** | **7,70** |
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| | | |
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| Kelengkapan dan Kesesuaian Unsur | : | abstrak tertulis lengkap dan informatif. Pendahuluan, metode, hasil dan pembahasan, simpulan tertulis lengkap sesuai dengan kaidah penulisan ilmiah. Daftar pustaka tertulis sesuai penulisan pustaka, beberapa pustaka > 10 tahun (23%) meski masih relevan |
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| Kecukupan & Kemutakhiran Data & Metodolo | : | merupakan penelitian eksperimental laboratoris, data didapat dari pemeriksaan serum dengan metode Elisa yang terstandar |
| Kelengkapan Unsur dan Kualitas Penerbit | : | Jurnal Internasional terindeks Scopus Q3, SJR 0,31 |

Semarang,
Reviewer1

Prof. Dr. Drg. Oedijani, MS
Bidang Ilmu: Kedokteran
Jabatan Fungsional: Guru Besar

C 5

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**KARYA ILMIAH : JURNAL ILMIAH**

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| Ruang Lingkup dan Kedalaman Pembahasa | : | Pembahasan sudah dilakukan dengan baik, dan merujuk pada paer yang terkait. Namun karena banyak istilah imunologi yang tidak diuraikan dengan baik perannya di introduction, pembaca yang bukan expert di bidang imunilogi menjadi kesulitan mengikuti artikel ini, sedangkan judulnya menarik untuk awam/non-expert. |
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| Kelengkapan Unsur dan Kualitas Penerbit | : | Merupakan jurnal terindex scopus Q3 SJR 0.27 (2020). Pada webpage home: informasi yang disampaikan adalah Article Processing Charge. Tidak ada informasi terkait article process/review, hanya ditemukan keterangan mensubmit paper melalui manuscript central. Lokasi penerbit di Malaysia. Grammar dan syntax error masih ditemukan. (Kesimpulan is a new fact) |

Semarang, 3-8-2020
Reviewer 2

Prof. Dr. dr. Tri Indah Winarni, MSi.Med, PA
NIP 196605101997022001
Unit kerja: Fakultas Kedokteran Undip
Bidang Ilmu: Kedokteran
Jabatan Fungsional: Guru Besar

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- Food chemistry
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International Food Research Journal 25(5): 1912-1919 (October 2018)
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# Thermal degradation kinetics of total carotenoids and antioxidant activity in banana-pumpkin puree using Arrhenius, Eyring-Polanyi and Ball models

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*Banana-pumpkin puree*
*Thermal treatment*
*Degradation kinetics*
*Total carotenoids*
*Antioxidant activity*

**Abstract**

The effect of thermal treatment (60, 70, 80 and 90°C) on degradation kinetics of total carotenoids and antioxidant activity (DPPH assay) in banana-pumpkin puree was investigated using Arrhenius, Eyring-Polanyi and Ball models. The heating temperatures had a significant effect on total carotenoids loss, but little effect on loss of DPPH inhibition in banana-pumpkin puree. 37% of total carotenoids content was remained after heat at 90°C for 60 mins, while the remaining of DPPH inhibition was 96% at this heating condition. Degradation kinetics was best described by first-order kinetics reactions for the reduction of total carotenoid and antioxidant activity. Temperature dependence of rate constants followed the Arrhenius, Eyring-Polanyi and Ball models. According to Arrhenius model, activation energies were 35.36 and 27.83kJ/mol, respectively for degradation of total carotenoids and DPPH inhibition in banana-pumpkin puree during heating at 60-90°C. Arrhenius, Eyring-Polanyi and Ball models predicted accurately the total carotenoids content and DPPH inhibition during isothermal heating.



## Introduction

Banana (*Musa* spp.) and pumpkin (*Cucurbita* spp.) are cultivated in tropical and subtropical regions including Thailand and consumed as various products throughout the world. Banana may be processed as puree, banana powder, chip, vinegar and wine, and pumpkin can be processed to as puree, syrup and chip (Tsen and King, 2002; Gliemmo *et al*., 2009). Commonly, fruit-vegetable purees are used as an ingredient of food products including beverages, jams and jellies. Purees are ideal foods for infants, senile and dysphagia adults. Additionally, purees/pastes are market favorites in fast food industries.

Banana and pumpkin are rich in nutrients and phytochemical compounds especially carotenoids (Englberger *et al*., 2003; Gliemmo *et al*., 2009), which contribute to color synthesis in fruits and vegetables with color ranging from yellow to red (Gliemmo *et al.,* 2009). Carotenoids are pro-vitamin A, which has antioxidant, anticarcinogenic and antimutagenic activities. Many studies indicated that carotenoids intake reduce the risk of certain types of cancer, cardiovascular diseases, cataracts and macular degeneration. Carotenoids also play a significant function in disease prevention (Provesi *et al.,* 2011; Demiray *et al.,* 2013).

Carotenoids can be degraded into another form by oxidation and isomerization during processing and storage, resulting in discoloration, reduction in nutrition and changes in biochemical properties (Provesi *et al.*, 2011). Many factors affect oxidation of carotenoids including temperature, light, oxygen, pro-oxidant metals, and co-oxidation with unsaturated lipids. *Trans-cis* isomerization reactions are normally induced by heat, acids and light (Bonnie and Choo, 1999; Gliemmo *et al*., 2009).

Food processing often involves heating that inhibits or kills microorganisms extending shelf life. It has also significant influence on nutrients and functional health properties. Thermal degradation of carotenoids and antioxidative properties of food products have been reported. Provesi *et al*. (2011) found the predominant carotenoids viz. violaxanthin, lutein, ζ-carotene, α-carotene and all-*trans*-β-carotene in pumpkin purees apparently decreased after thermal treatments at 100 and 121°C for 20 mins concurrently with an increase of *cis*-β-carotene. Benlloch-Tinoco *et al.* (2015) also reported a decline of the major carotenoids such as lutein, neolutein A and B, β-carotene, neoxanthin and violaxanthin in kiwifruit puree following heating at 97°C for 30s, as compared to fresh puree. Moreover, the thermal degradation of antioxidant activity has been reported

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# Effect of pre-treatments on the phytochemical composition of watermelon *(Citrullus lanatus)* rind

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*Water blanching*
*Watermelon rind*
*Anti- nutrients*
*Anti-oxidant*

**Abstract**

Processing of watermelon generates considerable amount of wastes in the form of peels, rind and seeds. Every part of the fruit has nutritional value, including the rind, peel and the seeds. These wastes are also rich in phytochemicals and can be exploited to investigate its nutraceutical properties. Thus, the present study was designed to determine the effects of blanching on the overall quality of the watermelon rind. The rind was steam and water blanched for 1, 2 and 3 minutes. The samples were then analyzed for their phytochemical contents. Results demonstrated that blanching had considerable effects on the phytochemical composition and anti-nutrient properties of the watermelon rind. There was drastic reduction in the anti-nutrients as a result of blanching. Steam blanching was more efficient in preserving the antioxidant activity and total phenol content in comparison to water blanching. While water blanching brought about a drastic reduction in the anti-nutritional factors.



## Introduction

Significant amount of fruit and vegetable wastes are generated by the food processing industries. These large amounts of solids waste arising from the consumption of fruit and vegetable are known as agro wastes which pose problems in disposal and also lead to loss of valuable biomass and nutrients. These agro wastes can be converted into useful products for the production of functional foods from fruits and vegetables.

Enhancing food waste utilization in daily diets and also in drugs could enhance food supply, health and the environment. The increasing waste burden on the environment could be managed by preventing the accumulation of these solid food wastes by waste disposal or by increasing the dietary utilization of the wastes (Anthony, 2015).

Research by Peschel *et al.* (2006) shows that by-products in general contain a variety of biologically active compounds that are mostly discarded as wastes. This not only causes a loss in the potentially valuable resource but also aggravates a problem of waste disposal. The use of these wastes can contribute to lower production costs in the food industry and create alternative functional foods for human consumption.

Fruits and vegetables are known to contain a variety of natural bioactive compounds (Pennington and Fisher, 2010) such as flavonoids, anthocyanins, vitamins C and E, phenolic compounds, dietary fibre, and carotenoids (Gonzalez-Aguilar *et al.*, 2008).

One such medicinal plant is *Citrullus lanatus.* Every aspect of the fruit has nutritional value, including the rind, peel and the seeds. The rind is usually discarded but they are edible, and sometimes used as a vegetable. Jayaprakasha *et al.* (2001) stated that the seed, peel and rind of some fruits have greater vitamins, fibres, minerals and other essential nutrients than the pulp. The most common way watermelon is eaten, is the consumption of the pink or yellow flesh. However, other ways of consumption include watermelon rind pickles, deep fried watermelon, watermelon flavoured cake and watermelon lemonade (Wind, 2008).

The therapeutic effect of watermelon has been attributed to antioxidant compounds (Leong and Shui, 2002; Lewinsohn *et al.*, 2005) such as citrulline which protects the body from free-radical damage. Also, citrulline is converted to arginine, an amino acid that is vital for the functioning of heart, circulatory system and immune system. Thus researchers speculate that watermelon rind might bring about a relaxation in the blood vessels (Rimando and Perkins-Veazie, 2005).

The knowledge of the nutritive and the anti-nutrient content of various parts of the fruits will encourage the consumption and re-utilization of

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