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**THE EFFECT OF COOKING METHODS ON TOTAL PHENOLIC AND  
ANTIOXIDANT ACTIVITY OF SELECTED 'ULAM'**

**By**

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**RESEARCH PROJECT submitted in partial fulfillment of the requirements for the  
Degree of Bachelor of Food Science  
(Food Service and Nutrition)**

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## DECLARATION

I hereby declare that this research project is based on my original work except for quotations and summaries which have been duly acknowledgement.

25<sup>th</sup> June 2007



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(NURAIYU BINTI RASTAM)

Approved by,

25<sup>th</sup> June 2007

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(PUAN ZAMZAHAILA BINTI MOHD ZIN)

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## ABSTRACT

This study was conducted to determine the total phenolic content and antioxidant activity of selected green vegetables. The effect of thermal treatment on antioxidant activity and phenolic content were also studied. *Brassica alboglabra* (Kale), *Amaranthus oleracea* (spinach), *Brassica rapa var parachinensis* (flowering white cabbage) and *Brassica juncea* (mustard green) were used in this study. Methanol was used as extracting solvent. The oxidative activity of methanol were measured by using 2,2- diphenyl-2-picrylhydrazyl (DPPH) assay method whereas, total phenolic compound (TPCs) was measured by using Folin-Ciocalteu method. Among the samples tested, methanol extracts of flowering white cabbage had a highest total phenolic content while the lowest was seen in spinach's extracts for the fresh ones. It is interesting to note that there were significant ( $p < 0.05$ ) difference between all samples tested. In Folin-Ciocalteu method, the samples of blanching method was seen to have the highest while boiling had the lowest in total phenolic content. In DPPH method, it is interesting to note that there were significant ( $p < 0.05$ ) difference towards the different cooking methods for the methanol extracts of kale. Among the samples tested, extracts of kale shown the highest antioxidant activity during all cooking methods except for blanching method. There were no significant difference in oxidative activity towards all different cooking method in extracts of spinach and mustard green. In DPPH method, the fresh samples showed the highest while boiling method was seen to have the lowest in antioxidant activity.



## KESAN PELBAGAI KAEDAH MEMASAK KE ATAS JUMLAH FENOLIK DAN AKTIVITI PENGOKSIDAAN DI ANTARA SAYURAN HIJAU YANG TERPILIH

### <sup>1</sup>ABSTRAK

Kajian ini dijalankan adalah untuk menentukan jumlah fenolik dan aktiviti pengoksidaan di antara sayuran yang terpilih. Kesan suhu pemanasan ke atas jumlah fenolik dan aktiviti pengoksidaan juga dikaji. *Brassica alboglabra* (Kailan), *Amaranthus oleracea* (bayam hijau), *Brassica rapa var parachinensis* (sawi bunga kuning) and *Brassica juncea* (sawi hijau) telah digunakan dalam kajian ini. Larutan metanol telah digunakan sebagai larutan pengekstrakan. Aktiviti pengoksidaan telah diukur dengan menggunakan kaedah 2,2-diphenyl-2-picrylhydrazyl (DPPH) manakala jumlah kandungan fenolik ditentukan dengan menggunakan kaedah Folin-Ciocalteu. Di antara sampel yang diuji, ekstrak sawi bunga kuning telah mencatatkan jumlah kandungan fenolik yang paling tinggi manakala kandungan yang paling rendah adalah dalam ekstrak bayam hijau bagi kaedah sayur yang tiada kaedah memasak. Terdapat perbezaan yang signifikan ( $p < 0.05$ ) di antara semua sampel yang diuji. Bagi kaedah Folin-Ciocalteu, sampel bagi kaedah penceluran adalah tertinggi manakala sampel bagi kaedah pendidihan mencatatkan jumlah kandungan fenolik yang terendah. Bagi kaedah DPPH, terdapat perbezaan yang signifikan ( $p < 0.05$ ) untuk kesemua kaedah memasak bagi ekstrak kailan. Di antara kesemua sampel yang diuji, ekstrak kailan mencatatkan aktiviti pengoksidaan yang paling tinggi di antara sampel yang lain bagi kesemua kaedah memasak kecuali kaedah penceluran. Tiada perbezaan yang signifikan ( $p > 0.05$ ) untuk aktiviti pengoksidaan bagi kesemua kaedah memasak bagi ekstrak bayam hijau dan sawi hijau. Bagi kaedah DPPH, sampel yang tidak menggunakan kaedah memasak menunjukkan aktiviti pengoksidaan yang tertinggi manakala kaedah pendidihan didapati mempunyai aktiviti pengoksidaan yang terendah.