

A COMPARISON ON NUTRITIONAL VALUE AND SENSORY  
QUALITY OF SELECTED HYDROPONICALLY, ORGANICALLY,  
AND CONVENTIONALLY PRODUCED VEGETABLES

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MENGABANG PERANG

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SELECTED HYDROPONICALLY, ORGANICALLY, AND CONVENTIONALLY  
PRODUCED VEGETABLES**

**CHAN CHIN FOONG**

**RESEARCH PROJECT submitted impartial fulfilment 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 acknowledged.

3 May 2006


CHAN CHIN FOONG

UK 9084

A handwritten signature in black ink, appearing to read 'Chan Chin Foong', written in a cursive style.

Approved by,

3 May 2006

A handwritten signature in black ink, appearing to read 'Mohamad Khairi Mohd. Zainol', written in a cursive style.

EN. MOHAMAD KHAIRI MOHD. ZAINOL  
(Supervisor)

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## ABSTRACT

Nowadays, the choices of consumer on foods are significantly increased. They are provided with several types of products even though these products were in the same group. In this study, the aims were to compare the vegetables derived from hydroponics, organic, and conventional growing system in two key areas: nutritional value and sensory quality. It is evident from this assessment that there were few well-controlled studies that are capable in making a valid comparison. Considerations of the impact of different growing system on nutrient bioavailability have received little attention and are important for human health. While the reports are indicating that hydroponics, organic and conventional vegetables may differ on a variety of nutrient content and sensory quality, but the results are inconsistent. Review from the results, a group of vegetables derived from same growing system shows highest and also lowest content in certain nutritional values at the same time. For example, conventionally produced cabbage showed the highest value of vitamin C ( $55.80 \pm 15.87$  mg/100g) among the three type of growing system but lettuce from the same farm showed the lowest contents of vitamin C ( $6.76 \pm 2.29$  mg/g sample). The results of sensory evaluation also happened at same situation. Most of the chemical constituents and quality attributes of vegetables are affected by genotype, growing condition, disease and post harvest history. In the future research, the possibility that growing system, genetics, environment, post-harvest practices, and distribution system may give influence to this type of study should be evaluated.

# **PERBANDINGAN KANDUNGAN NUTRIEN DAN KUALITI SENSORI DI ANTARA SAYURAN YANG DIHASILKAN SECARA SISTEM PENANAMAN BIASA, ORGANIK, DAN HYDROPONIK**

## **ABSTRAK**

Pada masa kini, pilihan makanan bagi pengguna semakin bertambah. Terdapat pelbagai produk yang dibekalkan meskipun produk tersebut tergolong dalam kumpulan makanan yang sama. Dalam kajian ini, tujuannya adalah untuk membezakan sayuran yang dihasilkan dengan 3 jenis sistem penanaman yang berlainan iaitu secara hydroponik, organik dan juga cara penanaman yang biasa. Kriteria- kriteria yang diuji termasuklah kandungan nutrien di dalam sayuran tersebut dan juga kualiti sensori yang terdapat padanya. Penilaian ini dapat dibuktikan kerana kekurangan kajian terkawal yang mampu menghasilkan perbandingan yang sahih. Ini juga bertimbang kepada kesan sistem penanaman yang berbeza terhadap kebolehdapatan nutrien di dalam tumbuhan secara biologi. Kurang prihatin yang ditumpukan kepada isu ini sedangkan ini adalah sangat penting dari segi kesihatan. Sementara laporan yang didapati menunjukkan terdapat perbezaan kandungan nutrient dan kualiti sensori di antara hasil sayuran daripada sistem penanaman yang berlainan; namun keputusan yang didapati adalah tidak konsisten. Melihat ke atas keputusan daripada analisis kimia, sekumpulan sayuran yang dihasilkan dengan cara penanaman yang sama menunjukkan kandungan nutrient yang paling tinggi dan juga paling rendah di antara tiga jenis cara penanaman itu pada masa yang sama. Sebagai contoh: kobis yang ditanam secara biasa menunjukkan kandungan vitamin C sebanyak  $55.80 \pm 15.87$  mg/100g sample, iaitu paling tinggi di antaranya. Pada masa yang sama, salad daripada cara penanaman yang sama menunjukkan kandungan vitamin C yang paling rendah iaitu hanya  $6.76 \pm 2.29$  mg/100g sample. Keadaan ini juga berlaku dalam keputusan yang didapati daripada penilaian sensori. Kebanyakan jujuk kimia dan atribut kualiti dalam sayuran adalah bergantung kepada genetik, keadaan pertumbuhan, penyakit dan juga sejarah lepas-tuai bagi sayuran tersebut. Pada kajian masa depan, faktor-faktor yang membawa kesan kepada kajian demikian seperti sistem pertumbuhan, genetik, persekitaran, amalan lepas-tuai dan sistem pengagihan perlulah diambil-kira sebaik mungkin.