

**PREPARATION OF *SOUS VIDE* CHICKEN RICE AND CHICKEN KEEL**

**By**

**TAN CHENG HUAT**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,  
in Fulfilment of the Requirement for the Degree of Master of Science**

**December 2005**

**This work is dedicated to  
all my family members  
who had given me the full support**

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in  
fulfilment of the requirement for the degree of Master of Science

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**Chairman : Professor Russly Abdul Rahman, PhD**

**Faculty : Food Science and Technology**

Time-temperature profiles and process time for *sous vide* chicken rice and chicken keels were obtained through heat penetration test. For 5 D processed chicken rice, the process time obtained by using General Method at 65, 70, 75, 80 and 85°C were 58.8 min, 34 min, 23.5 min, 18 min and 14 min. For 13 D processed chicken rice, the process time were 125.8 min, 61.8 min, 34.5 min, 24 min and 18.5 min, respectively. In slow heating (75°C) of chicken keel, the process time for 5 D and 13 D processes were 26.7 and 38.3 min whereas for the fast heating (90°C), were 16.5 and 19.2 min, respectively. Ball's method could also be used for the computation of process time due to minor percentage of deviation from General Method (4 - 14% for all the process time computed above). Traditional cooked chicken rice (the reference) with pH 6.29 and  $a_w$  0.986 meanwhile *sous vide* chicken rice products, with pH 6.35 and  $a_w$  0.984, had microbiological and chemical stability from day 0 until week 4. Generally, better aroma and flavour retention were obtained in the *sous vide* products compared to the traditional cooked products.

Texture changed significantly ( $P < 0.05$ ) when different cooking method or time-temperature combination was used but not for storage duration. Chicken keels were also stable from any microbiological spoilage. TBA test showed significant ( $P < 0.05$ ) changes in rancidity although the sensory mean scores were only at the low range of 1-3. Although the preference of panelists towards the *sous vide* products was not significant ( $P < 0.05$ ), *sous vide* products showed their benefits as better retention in aroma and flavour, lower cook loss, juicier and more tender compared to the traditionally cooked products.

Abstrak tesis yang dikemukakan kepada Senat Universtiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**PENYEDIAAN NASI AYAM DAN DAGING AYAM (BAHAGIAN DADA)  
*SOUS VIDE***

Oleh

**TAN CHENG HUAT**

**Disember 2005**

**Pengerusi : Profesor Russly Abdul Rahman, PhD**

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Profil masa-suhu serta masa pemprosesan, untuk nasi ayam dan dada ayam yang diproses melalui kaedah *sous vide*, diperolehi melalui ujian penusukan haba. Suhu pempasteuran dan masa pemprosesan (dengan menggunakan Kaedah Am) untuk mencapai takat pempasteuran yang dikehendaki melibatkan kekuatan pemanasan yang berlainan, iaitu 5 D dan 13 D. Untuk nasi ayam *sous vide*, masa pemprosesan yang diperolehi untuk kekuatan pemanasan 5 D pada suhu 65, 70, 75, 80 dan 85°C adalah 58.8 min, 34 min, 23.5 min, 18 min dan 14 min manakala untuk 13 D pula, masa pemprosesan yang diperlukan adalah 125.8 min, 61.8 min, 34.5 min, 24 min dan 18.5 min. Untuk dada ayam pula, dua kadar pemanasan, iaitu kadar perlahan (75°C) dan kadar cepat (90°C) telah dikaji. Dalam proses pemanasan perlahan, masa pemprosesan bagi keamatan pemanasan 5 D dan 13 D ialah 26.7 dan 38.3 min manakala proses pemanasan pantas cuma memerlukan 16.5 dan 19.2 min sahaja. Kaedah Ball boleh juga digunakan dalam pengiraan masa pemprosesan disebabkan oleh ralat yang rendah

ditunjukkan bila dibandingkan dengan Kaedah Am (ralat sebanyak 4 – 14% untuk pengiraan masa pemprosesan yang tersebut di atas). Nasi ayam yang dimasak secara tradisional (sampel rujukan) dengan pH 6.29 dan  $a_w$  0.986 manakala nasi ayam *sous vide*, dengan pH 6.35 dan  $a_w$  0.984, didapati dalam keadaan yang stabil dari segi mikrobiologi dan kimia dari hari 0 hingga minggu yang keempat. Secara umumnya, produk yang dihasilkan dengan kaedah *sous vide* menunjukkan pengekaln aroma dan perisa yang lebih baik berbanding dengan masakan tradisional. Textur berubah dengan bererti ( $P < 0.05$ ) apabila cara masakan atau kekuatan pempasteuran yang berlainan digunakan tetapi tidak dengan tempoh penyimpanan. Dada ayam juga stabil dari kerosakan yang disebabkan oleh mikrob. Ujian TBA menunjukkan perubahan bererti dalam ketengikan tetapi purata skor penilaian deria untuk ketengikan menunjukkan taburan ini berada pada paras yang rendah iaitu antara 1 – 3. Penilaian deria terhadap produk yang dinilai tidak menunjukkan perbezaan bererti tetapi produk *sous vide* telah menunjukkan kebaikan iaitu pemeliharaan aroma dan perisa, pengurangan kecutan semasa memasak, lebih bersari dan lembut berbanding dengan masakan tradisional.

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I certify that an Examination Committee has met on 28 December 2005 to conduct the final examination of Tan Cheng Huat on his Master of Science thesis entitled “Preparation of *Sous Vide* Chicken Rice and Chicken Keel” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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## **DECLARATION**

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

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**TAN CHENG HUAT**

Date :

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