

DEPLOYMENT OF TAGUCHI METHOD FOR OPTIMIZATION OF HEAT TREATMENT PROCESS PARAMETERS IN RAW UNCLEAN EDIBLE BIRD'S NEST

(Pelaksanaan Kaedah Taguchi untuk Pengoptimuman Proses Parameter Rawatan Haba Sarang Burung Walit Mentah Belum Bersih)

TAY GUO XUAN*, MAS NORDIANA RUSLI, KHAIRUL ANUAR MOHD ALI & ZAINOL MUSTAFA

ABSTRACT

Heat treatment process as one of the Critical Control Points (CCP) of raw unclean edible bird's nest processing. Main objective of the study was on the determination of optimal combination for the processing. The treatments were the combinations from orthogonal array and signal to noise ratio from Taguchi method with several control variables of conveyor belt speed (0.5, 1.0, 1.5 rpm), temperature of steam shrink tunnel (80, 90, 100 °C) and temperature sensors allocation (Base, Body, Head) were applied in heat treatment process. L_9 (3^3) orthogonal array was adopted in the study where 18 runs were performed with two replications. For this case study, "larger-the-better" approach was selected with the aim to minimize heat penetration time. Results displayed that the optimum condition for heat penetration duration was 11 seconds, where the conveyor belt speed, steam shrink tunnel temperature and temperature sensor allocation were 0.5 rpm, 90°C and head position respectively. Conveyor belt speed was the highest factor that affected heat penetration duration of raw unclean edible bird's nest.

Keywords: edible bird's nest; heat treatment; Taguchi's optimization

ABSTRAK

Proses rawatan haba sebagai salah satu Titik Kawalan Kritikal (CCP) pemprosesan sarang burung walet mentah belum bersih. Objektif utama kajian adalah untuk menentukan kombinasi optimum untuk pemprosesan. Rawatan tersebut adalah gabungan daripada tatasusunan ortogon dan nisbah S/N daripada kaedah Taguchi dengan beberapa pembolehubah iaitu kawalan kelajuan tali sawat (0.5, 1.0, 1.5 rpm), suhu terowong pengecutan wap (80, 90, 100 °C) dan peruntukan sensor suhu. (Asas, Badan, Kepala) digunakan dalam proses rawatan haba. Tatasusunan ortogon L_9 (3^3) telah diterima pakai dalam kajian di mana 18 larian dilakukan dengan dua ulangan. Untuk kajian kes ini, pendekatan "lebih besar-lebih-baik" telah dipilih dengan tujuan untuk mengurangkan masa penembusan haba. Keputusan analisis menunjukkan bahawa keadaan optimum untuk tempoh penembusan haba ialah 11 saat, di mana kelajuan tali sawat, suhu terowong pengecutan stim dan peruntukan sensor suhu adalah 0.5 rpm, 90°C dan posisi kepala. Kelajuan tali pinggang penghantar adalah faktor yang memberi pengaruh yang paling tinggi kepada tempoh penembusan haba sarang burung walet mentah belum bersih.

Kata kunci: sarang burung walet; rawatan haba; pengoptimuman Taguchi

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Bio Life Nutraceuticals Sdn Bhd
No. 9, Jalan P4/8B
Bandar Teknologi Kajang
43500 Semenyih
Selangor DE, MALAYSIA
E-mail : briangx95@gmail.com*

Department of Accounting
Faculty of Business and Economics
University of Malaya
50603 Kuala Lumpur
Federal Territory of Kuala Lumpur, MALAYSIA
E-mail : annarusli@um.edu.my

*UKM-Graduate School of Business (UKM-GSB)
Universiti Kebangsaan Malaysia
43600 UKM Bangi
Selangor DE, MALAYSIA
E-mail : kabma@ukm.edu.my*

*Centre for Modelling and Data Analysis (DELTA)
Department of Mathematical Sciences
Faculty of Science and Technology
Universiti Kebangsaan Malaysia
43600 UKM Bangi
Selangor DE, MALAYSIA
E-mail : zbhm@ukm.edu.my*

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