

UNIVERSITI TEKNOLOGI MARA

**EVALUATION OF HALALAN
TOYYIBAN RISK MANAGEMENT
PLAN (HTRMP) PRACTICES
DURING RECEIVING ACTIVITIES
IN WAREHOUSE OF FROZEN
CHICKEN FRANKFURTERS**

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.


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ABSTRACT

Halalan-toyyiban food supply chain is important to preserve the Halal integrity, safety and quality of Halal food products in the whole chain of product movement. This study highlights the concept of Halal frozen food chain that covers the issues of food Halalness, the safety and quality aspects of frozen food products along activities on warehousing stage. A cold chain provides the essential facilities and methods required to maintain the Halal and quality of foods. Halalan-toyyiban Risk Management Plan (HTRMP) is used to determine the Halal Critical Control Point (HCCP) which may affect the status of frozen food products either in term of Halal, safety or quality. Some interview and focused group were conducted to know the overview of Halal warehousing activities. Survey was conducted to determine the elements that can be used as auditing checklist during receiving frozen chicken frankfurters at warehouse either for internal or external audit. Furthermore, the activities along receiving of frozen food products were observed at selected distribution centre. This observation was covering the operational practices, personal hygiene practices and sanitation programme. It shows that there are poor personal practices and limited sanitation programme implemented at this selected frozen food distributor. This study also aims to examine the physicochemical and microbiological properties of frozen chicken frankfurters during receiving at warehouse. From the study, questionnaires shown that the warehouse service providers were practiced HTRMP. While from observation, it found that there were few warehouse or distributors were not practiced HTRMP. Temperature abuse combined with poor operational practices are the foremost factors in the mishandling of frozen food products which can result in outbreaks of food borne disease. From this study, it shows that the distributor does not monitor temperature during receiving and storage properly. Then the samples were taken for physicochemical and microbiological analysis. Based on the result, the data shown no significantly difference between the frozen chicken frankfurter after receiving at food distributor and after thawing for 5 hours in term of colour, moisture content, texture, pH and water activity. There were result found for physicochemical analysis of chicken frankfurters after receiving and after thawing for 5 hours. Data after receiving of chicken frankfurters were colour ($L^* = 70.64 \pm 2.15^a$, $a^* = 8.48 \pm 0.70^a$, $b^* = 19.72 \pm 1.52^a$), moisture content (33.97 ± 3.96^a), texture (Hardness = 9.717 ± 4.14^a , Springiness

= 0.85 ± 0.09^a , Cohesiveness = 0.38 ± 0.11^a , Gumminess = 4.03 ± 2.93^a , Chewiness = 3.29 ± 2.03^a , pH (6.69 ± 0.23^a) and water activity (0.96 ± 0.01^a). On the other hand, the result after thawing 5 hours were colour ($L^* = 69.84 \pm 3.14^a$, $a^* = 8.29 \pm 0.66^a$, $b^* = 18.81 \pm 0.88^a$), moisture content (33.04 ± 2.14^a), texture (Hardness = 7.778 ± 1.97^a , Springiness = 0.86 ± 0.04^a , Cohesiveness = 0.33 ± 0.06^a , Gumminess = 2.81 ± 1.39^a , Chewiness = 2.32 ± 0.96^a), pH (6.87 ± 0.07^a) and water activity (0.97 ± 0.00^a). While for microbial analysis, frozen chicken frankfurters condition during receiving were at high risk level due to temperature were not monitored and controlled properly although the data shown not significantly differ. Result found for microbiological after receiving of chicken frankfurters were *aerobic mesophilic* = 4.28 ± 0.17^a log cfu/g, *Enterobacteriaceae* 2.76 ± 1.18^a log cfu/g, *Coliform* = 2.31 ± 1.20^a log cfu/g, *Staphylococcus* = 2.29 ± 0.23^a log cfu/g, and non-detected for *E. coli*, yeast and mould and *Salmonella*. Hence, after thawing for 5 hours the result found were *aerobic mesophilic* = 5.14 ± 0.80^a log cfu/g, *Enterobacteriaceae* 3.42 ± 1.52^a log cfu/g, *Coliform* = 3.07 ± 1.38^a log cfu/g, *Staphylococcus* = 2.65 ± 0.67^a log cfu/g, and non-detected for *E. coli*, yeast and mould and *Salmonella*. However, the environmental cleanliness at the food distributor also unsatisfactory. This leads to contamination to occurs as the microbiological counts found to be high on frozen chicken frankfurters during receiving at distributors. This study suggested HTRMP as a guideline to the cold warehouse and distribution center for maintaining the Halal and toyyiban status of frozen food products.

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