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VCENDOL: RETORT PROCESS FOR READY-TO-DRINK (RTD) CENDOL

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Highlights: *Cendol* is a local Malaysian favourite dessert was prepared as per traditional method. It is an iced sweet dessert that contains droplets of green rice flour jelly, coconut milk and palm sugar syrup. *VCendol* innovate the traditional *cendol* in a bowl into a bottle. The main innovation highlighted by *VCendol* is innovation process of retort process for ready-to-drink (RTD) *cendol*. This process is widely used for ready-to-eat (RTE) products, but for RTD especially *cendol* is still under research. Thus, this project attempt to testing the develop shelf-stable RTD *cendol* as an alternative for soft drink products using retortprocess.

Key words: *Retort, retort processing, ready-to-drink, RTD, ready-to-eat, RTE*

Introduction

Versatile Food and Beverage is a start-up venture established in August 2019 with start-up capital of RM1,000. This business is officially registered in June 2020. The founder of Versatile Food and Beverage is Tuan Muhammad Muiz Bin T Nordin, 24 years old, a fourth-year student of Bachelor of Entrepreneurship with Honours at Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan. He is expected to graduate in this coming September.

VCendol is an acronym of founder registered company which is Versatile Food and Beverage. V stands for Versatile and *cendol* is a local Malaysian favourite dessert. The main product for this business is *cendol* in the bottle. *Cendol* is an iced sweet dessert that contains droplets of green rice flour jelly, coconut milk and palm sugar syrup. It is commonly found in Southeast Asia including Malaysia especially in the East Coast Region.

Description of Retort Process for Ready-To-Drink (RTD)

VCendol transforms the *cendol* in a bowl (*mangkuk*) into a bottle due to increasing of consumer demand for high quality convenient ready-to-eat food products. This situation also leads to the rose of production of ready-to-eat products commercialisations (Kumar et al., 2013). Besides that, *VCendol* offers unique selling proposition in terms of Ready-To-Drink (RTD), premium *cendol* taste, convenient, long shelf-life and diversities of flavours such as *pandan*, strawberry and mango.

Background of Retort Process for Ready-To-Drink (RTD)

VCendol is totally different and offers new competitive advantages compared to existing *cendol*. Instead of mentioned unique selling proposition, *VCendol* highlights to cater short shelf-life issue as well as hygiene issue by using the retort process for ready-to-drink (RTD) *cendol*. Retort processing is a technology that has been widely acknowledged as one of the substitutions to metal cans for creating thermally handled shelf stable foods (Sabapathy et al., 2001; Abhishek, 2014). This process is withstanding thermal processing temperatures and combine the advantages of the metal can and plastic packages. This packaging is unique alternative packaging method for sterile, shelf stable products (Sabapathy & Bawa, 2003).

Advantages of Retort Process for Ready-To-Drink (RTD)

The retort process has many advantages over canned and frozen food packages, both for the customers as well as food manufacturers. The advantages of using this technology are consumers consistently can trust the safety of the product, have a longer shelf life and no preservatives will be needed as the product remains natural as possible. Additionally, this process is pouch profile, package cost, storage and preparation efficiency, savings in transportation, improved flavour and energy saving (Kumar et al., 2007; Mohammedali Shihab et al., 2013).

Commercial value Retort Process for Ready-To-Drink (RTD)

VCendol commercialization by improving the production from homemade into large scale production is expected to give impact on the community by offering job opportunities in terms of agents, stockists and runners. Small businesses contribute to local economies by bringing growth and innovation to the community in which the business is established. Through this, *VCendol* also helps stimulate economic growth and increase the GIG economy development in Malaysia which directly impacts the labour market. It contributes to local economies by bringing

growth and innovation to the community in which the business is established. Therefore, in this innovation an attempt has been made to develop shelf-stable RTD *cendol* as an alternate for soft drink products using retort process.

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References

- Kumar, R., Johnsy, G., Rajamanickam, R., Lakshmana, J.H., Kathiravan, T., Nataraju, S., & Nadasabapathi, S. (2013). Effect Of Gamma Irradiation And Retort Processing On Microbial, Chemical And Sensory Quality Of Ready-To-Eat (RTE) Chicken Pulav. *International Food Research Journal*, 20 (4), 1579-1584.
- Sabapathy, S. N., & Bawa, A. S. (2003). Retort Processing Of RTE Foods. *Food Nutrition World*, 1(12), 28-29.
- Sabapathy, S.N., Ramakrishna, A., & Srivastava, A. N. (2001). Current Status And Potential For Retort Processed Foods In India. *Indian Food Industry* 20(3), 78-79.
- Abhishek, V., Kumar, R., George, J., Nataraju, S., Lakshmana, J. H., Kathiravan, T., Madhukar, N., & Nadasabapathi, S. (2014). Development Of Retort Process For Ready-To-Eat (RTE) Soy-Peas Curry As A Meat Alternative In Multilayer Flexible Retort Pouches. *International Food Research Journal*, 21(4), 1553-1558.
- Mohammedali Shihab, C.P., Hafeeda, P., Kumar, R., Kathiravan, T., & Nadasabapathi, S. (2013). Development And Evaluation Of Shelf Stable Retort Processed Ready-To-Drink (RTD) Traditional Thari Kanchi Payasam In Flexible Retort Pouches. *International Food Research Journal* 20(4), 1765-1770.