

## Processed Food Innovation using Oyster Mushroom

**Abdul Rasid Abdul Razzaq<sup>1\*</sup>, Syed Shikh Syed A. Kadir<sup>1</sup>, Che Noor Nura Adilla Che Ahmad<sup>1</sup>, Abdul Wafi Abdul Rahman<sup>1</sup>, Hairuddin Harun<sup>1</sup>, Mohd Akmal Rohiat<sup>1</sup> & Raden Mohd Farhan Helmi Raden Ismail<sup>1</sup>**

<sup>1</sup>Faculty of Technical and Vocational Education,  
Universiti Tun Hussein Onn Malaysia, Batu Pahat, Johor, 86400 MALAYSIA

\*Corresponding Author Designation

DOI: <https://doi.org/10.30880/ritvet.2021.01.02.023>

Received 02 July 2021; Accepted 05 July 2021; Available online 28 September 2021

**Abstract:** The purpose of this study is to develop an innovative nugget product based on an oyster mushroom. This study's main objective is to observe the nugget's durability from the oyster mushroom and get to know the best way to package the product to a long-lasting store in the fridge. From the study and experiment conducted, experiment 1, which is steamed and dried the oyster mushroom at the first of the experiment, showed that it does not fulfill the criteria of the aroma, color, and taste of the oyster mushroom nugget. While in experiment 2, the oyster mushroom was steamed and burnt first, it showed the best result for aroma, color, and taste of the oyster mushroom nugget. Overall, the project's objective has been achieved for this research. It is hoped that this nugget mushroom innovation based on oyster mushrooms can be marketed further to elevate oyster mushroom products to a higher level.

**Keywords:** Innovation, Oyster Mushroom Nugget, Observe, Steamed, Dried

### 1. Introduction

Nowadays, in the globalization era, society in Malaysia is busy competing for raising the everyday life of living in a modern city line with world progress now. This case caused Malaysians to choose simple, quick, and easy to undergo their daily routine. Next, people like to take frozen food as their regular meal because it can save their time doing other things or jobs. Zakaria (2009) frozen product is a product that is produced by our market value that is the largest after bakery production and dairy production.

Frozen food production had recorded the highest sales value, as much as RM705.8 million (5.1%) compared to the production of other food sector sales value. Regardless of race, age, gender, and income level, frozen comfort food has become necessary for Malaysians (Ayub & Rani, 2019). There are various types of frozen foods that were produced from overseas or our beautiful country. Quality is the

---

\*Corresponding author: [rasid@uthm.edu.my](mailto:rasid@uthm.edu.my)

2021 UTHM Publisher. All rights reserved.

[publisher.uthm.edu.my/periodicals/index.php/ritvet](http://publisher.uthm.edu.my/periodicals/index.php/ritvet)

purchaser's grade of excellence or acceptability level (Aziz, Daud, & Sorooshian, 2019). For frozen food, Aziz, Daud & Sorooshian (2019) also said that quality can be defined as the composite of those characteristics that determine consumer acceptability for the frozen food industry.

As individuals need to be more effective in managing time and resources, the demand for ready to eat or ready to serve has increased each year (Ayub & Rani, 2019). Among these frozen foods produced by local entrepreneurs are frozen curry puff, nuggets, pancakes, spring rolls, etc. According to Buckle (1987), frozen food is a product made by local entrepreneurs that also gets high requests because this product can increase the buyer's appetite, particularly the youth group. There are many types of nuggets manufactured in Malaysia. Among the ingredients are chicken, meat, and vegetables. In Malaysia, the food industry manufactures these types of nuggets to diversify available nuggets in Malaysia. Usually, chicken nuggets are in high demand by the Malaysian community because this product's taste enhances the chicken's flavor.

There are many types of mushroom crops available in the world and each has its advantages and disadvantages. Mushrooms are a type of fungus that grows on soil or stems as a source of nutrients. There is oyster, cauliflower golden, button, cucumber, and shiitake mushrooms, and more among the mushrooms available in our country. There are two types of oyster mushrooms: white oyster mushrooms (*Pleurotus Florida*) and gray oyster mushrooms (*Pleurotus Pulmonarius*).

Therefore, oyster mushrooms' selection is very suitable for innovating a frozen product because it can benefit people who consume it. Oyster mushroom nugget products can help many consumers. Besides providing a variety of nutrients, frozen oyster mushroom nugget products are very suitable for children as children will be able to eat nuggets made from delicious vegetables. The innovation of this oyster mushroom-based nugget product is an excellent and potential venture to create a new market in the Malaysian food sector. It is because mushrooms are a widely known plant.

Nowadays, frozen food among urban consumers has become one of the necessities (Ayub & Rani, 2019). Among the problems that can be used as an excuse not to produce frozen products is that frozen foods are often associated with low nutritional content. As stated by Islam et al. (2019), frozen foods are not very nutritious and have low nutritional value in their study. According to Ismail, Nordin & Said (2013), retrieval research showed that processing the frozen foods and skills level among FELDA women is still moderate. It is also proved through the study that the entire research average is totaled 3.48% only with information on frozen cold foods processing. Apart from that, frozen product development based on mushrooms is still less developed in Malaysia. According to Ismail, Nordin & Said (2013), frozen food product packaging skills are also very important to ensure clean packaging and no component enables airflow to enter and out. Lastly, the storage period for frozen products and its freshness quality are influenced by content in it. According to Haimid *et. al* (2014), freezing the food will prevent the microorganisms from growing and enzyme activity in food products. These will cause food to become durable and not smelly. This process is also able to maintain food quality, including nutrition value, and so on. This study's main purpose is to observe the nugget's durability from the oyster mushroom and get to know the best way to package the product to a long-lasting store in the fridge.

According to FAMA, the benefits and benefits of both Oyster Mushrooms contain low calories, antioxidants, proteins, and various minerals and vitamins that can boost the immune system to fight the virus and bacterial infections and inhibit tumor growth and gene protection activities. Usually, these oyster mushrooms are used in cooking as a vegetable and produce downstream products such as frozen and light snacks. Selection of oyster mushrooms' use to be turned into a nugget comes after several tests and research and found that oyster mushrooms are also suitable for vegetable nuggets. The use of oyster mushrooms for the production of nuggets can also be beneficial and make nuggets available in Malaysia in many flavors and smells.

According to the Federal Agricultural Marketing Authority (FAMA), consumption of oyster mushrooms or products produced by mushrooms in large quantities was not recommended. It can cause dizziness in the body, such as vomiting and dizziness. This only happens when we eat unprocessed mushrooms, which means freshly picked mushrooms from the environment. This oyster mushroom is one of high-quality foods. Other parties, such as Usahawan Industri Kecil Sederhana (IKS), should promote this new product to generate revenue and further boost this product's demand. Benefits from the product can be formulated to affect health as they are low in calories, antioxidants, proteins and various minerals and vitamins that can boost the immune system to fight virus and bacterial infections, inhibit tumor growth and gene protection activities. The benefits of white oyster mushrooms and gray oyster mushrooms can impact nuggets' production based on oyster mushrooms to be studied. According to Mat Amin. et al. (2013), in their study, oyster mushrooms have their own agricultural techniques. Through the proper process, this oyster mushroom can reach its maturity level within 45-60 days. This proves that mushrooms need to be taken care of in the right way to ensure that their quality is maintained

## **2. Methodology**

The ADDIE model is used as a reference to produce nuggets based on oyster mushrooms. The ADDIE model was chosen because the elements in this model are suitable for use in the product development process as they are more structured and systematic. This model has five elements that make the development process easier which is ADDIE stands for analysis, product design, product development, product implementation and product evaluation.

### **2.1 Analysis of Product Phase**

In this phase, preliminary studies were conducted using document analysis methods. Document analysis is based on studies done using articles and journals. At this stage, the problem needs to be identified. A few things need to be analyzed as a guide to developing a product such as defining the scope of the study, defining statement issues, designing suitability, and data analysis.

### **2.2 Design of Product Phase**

In this phase, product preparation of oyster mushroom nugget specifications, as well as proper recipe selection, have been implemented. Researchers have also designed product designs to facilitate the preparation of oyster mushroom nuggets. This phase has helped the researcher to explain the need for product design based on the innovation and creativity needs of a dish.

### **2.3 Phase of Development Product**

The development phase is the third phase in the Addie model where the researcher has developed the proposed product design. In this phase, the researcher has carried out a study based on the product development steps required in the preparation of nugget innovation products based on oyster mushrooms. In addition, this phase involves developing oyster mushroom product recipes based on the design and selection of predefined ingredients. Each material item used in product development has been recorded and described in detail. The point here is that product improvements can be made efficiently and adequately. Proceeds for this development will go through trial and correction stages for improvement.

### **2.4 Implementation of Product Phase**

In this phase of the study, we conducted and implemented a food preparation process that was planned according to the design phase. In this phase, the researcher has implemented 2 experiments and 2 methods to manufacture the planned product according to the product's specifications and specifications. The products produced are meticulously observed and refined in terms of colour, taste, aroma and texture of the oyster mushroom nugget product. This product is researched so that this food

innovation product meets the stated objectives. These product innovation researchers have made product improvements to ensure that the food meets the design criteria of the product.

### 2.5 Evaluation of Product Phase.

The evaluation phase is the final phase of the process. The product produced will get results based on the method of observation implemented. Observation method was performed on product innovation using 2 product preparation methods for 2 weeks. This method is used to observe the durability of the innovation product in terms of the VOC (Voice of Customer) element used in product evaluation. The features are colour, feel, scent, and texture.

### 3. Results and Discussion

As a result of the test analysis, the researcher discovered and chose method 2, which is the method of steaming and first burning oyster mushrooms or steaming and drying and making nuggets to operate the frozen food innovation products as shown in Table 1. Method 1 is the method of steaming and drying oyster mushrooms first to be seen from the colour criteria, a slightly hard texture and less oyster mushrooms in the nugget compared to method 2 which gives a softer feel and texture compared to method 1.

**Table 1: Result for Method 1 and Method 2**

<b>Method</b>	<b>Result</b>
Method 1	The results of the first study showed that oyster mushroom nuggets do not have oyster mushrooms and that the texture of the nugget is a bit harsh. However, there are some drawbacks to the appearance and colour of the nugget of oyster mushrooms, the texture is less attractive and has a poor storage durability of only 7 days.
Method 2	The results of the second study found that oyster mushroom nuggets had a delicate mushroom flavour and that the texture of the nugget was soft. In addition, there are some changes in the appearance and colour of the oyster mushroom nuggets that are quite attractive, attractive texture and good storage durability that can last for up to 7 days.

After conducting this study, the researchers identified several suggestions that could be improved. The recommendations of such further studies are as follows:

- i. Improvements in the aspect of the material used to make the taste of nuggets are different from the existing nuggets on the market. As an example of the improvement of the flavoring aspect to give it a taste like spicy taste.
- ii. Variation of materials for the process of coating or making bread. Breadcrumbs were converted to tempura to coat the oyster mushroom nugget.
- iii. Different types of nugget products for example.
  - a) Oyster Mushroom Ball.
  - b) Spicy Nugget Oyster Mushrooms.
  - c) Oyster Mushroom Tempura.
  - d) Nuggets of Oyster Mushroom Radishes.
  - e) Oyster Mushroom Burger.

- iv. Packaging a product is very important in order to attract consumers to buy a food product or other product. Therefore, future innovations need to emphasize product packaging methods in order to make innovative products look more attractive and safer to market.

#### **4. Conclusion**

Overall, this study has met the objectives set by the researcher. The research questions raised in this study can be answered based on the aspects of assessment that have been implemented. In addressing the research question, the researcher always adheres to the weekly planning schedule as well as the guidance and advice of the supervisor so that the study can be carried out more smoothly and without problems.

In conclusion, researchers are very pleased with the study of the development of nuggets based on oyster mushrooms as they have successfully achieved their stated objectives and have answered all the research questions stated. It is hoped that this nugget mushroom innovation based on oyster mushrooms can be marketed further to elevate oyster mushroom products to a higher level.

#### **Acknowledgement**

The authors would like to thank the Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia for its support.

#### **References**

- Ayub, A., & Rani, R. M. (2019). Determining the performance levels of SMEs in frozen food manufacturing sector in Selangor. In Proceedings of the International Conference on Islamic Civilization and Technology Management. Vol. 23, p. 24.
- Aziz, A. A., Daud, S., & Sorooshian, S. (2019, December). Exploring Quality Influencing Factors for the Frozen Food Industry. In IOP Conference Series: Materials Science and Engineering (Vol. 697, No. 1, p. 012018). IOP Publishing.
- Buckle, K.A., R.A. Edwards, G.H. Fleet, dan M. Wootton, (1987). Ilmu Pangan. Diterjemah oleh H, Purnomo dan Adiono. Jakarta: Universitas Indonesia.
- Federal Agricultural Marketing Authority (FAMA). Kualiti Cendawan Tiram Kelabu Berpandukan Malaysian Standard. Dicapai daripada <http://www.fama.gov.my/documents/20143/0/cendawan+red.pdf/63676187-392a-48ce-4405-6d4090cb5568>
- Haimid, M. T., Wahab, M. A. M. A., Dardak, R. A., Rahim, H., Shamsudin, S., & Nizat, M. N. M. (2014). Consumer affinity for frozen traditional cakes in Selangor. *Econ Technol Manag Rev*, 9(2014), 81-89.
- Islam, N., Tahsin, N., Tarrannum, N., Salihee, R. Z., Tarannum, S., & Sujana, J. T. M. (2019). Factors Influencing the Consumers' Perceptions Towards Frozen and Ready-to-Cook Food Products in Bangladesh. In Proceedings of the 1st Global International Conference.
- Ismail, S., Nordin, N., & Said, M.R.M. (2013). Tahap pengetahuan dan kemahiran pemprosesan makanan sejuk beku (roti) dalam kalangan wanita felda (Doctoral dissertation, Universiti Teknologi Malaysia).
- Mat Amin, M.Z., Mohd, Y.S., & Harun, A. (2013). "Viability of oyster mushroom industry in peninsular Malaysia." *Economic and Technology Management Review*. Vol. 8, pp.13-25.

Zakaria. M. H (2009). Penggunaan dan kecenderungan pengguna terhadap makanan sejuk beku. *Economic and Technology Management Review* 4: 83 – 93.