

Research Article

Diversifying the Usage of Waste Ingredient as Dumpling Filling: Dumpling with Jackfruit Straw Dendeng Filling

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Abstract: The availability of many forms of frozen dumpling and their filling in the market today has enabled the consumer to enjoy other forms of frozen products, however, most of the dumpling and their filling in the market seems to be the same or common as the products were mixing and filled with normal ingredients and edible filling before steaming or frying process taking place. This dumpling is unique as the filling was made from waste ingredients known as jackfruit straw and a mixture of traditional Chinese and Malay food. The purpose of this innovative product made is to diversify and enrich the usage of waste ingredients; treated jackfruit straw to be cooked in dendeng paste as a filling for dumplings. This Jackfruit Straw Dendeng Filling can be marketed, as cost-effective and easy to prepare as the raw materials used are cheaper compare to existing dumplings in the market. It makes this product able to be produced in mass production. Proper treatment of waste ingredients using food-grade preservatives and proper cooking methods able to enhance the taste and shelf life of the product are other reasons this product was developed. Before the dumpling is produced, treated jackfruit straw filling needs to be produced. Then, the treated filling is cool for a few hours. The ingredients of dumpling dough are being weighed accurately before the mixing, cooking, and filling process. Finding on a consumer preference test using Microsoft Excel 2016; untrained ($n = 30$) using sample code scale (7 scales) from extremely dislike to extremely like with 3 different samples (V1, V2 & V3). They are seven attributes being assessed i.e. aroma, texture, appearance, flavor, the thickness of filling, combination of skin and filling, and overall acceptability indicates the majority of the panels preferred V2 (frying jackfruit straw) with a 4.9 mean score followed by V3 with 4.8 mean scores (baking jackfruit straw) and lastly V1 with 4.7 mean score frying jackfruit straw with flour).

Keywords: waste ingredient; dumpling filling; jackfruit straw.



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1. INTRODUCTION

Traditional Chinese dumpling or known as *jiaozi*, has a long history and is widely consumed in East and Southeast Asian countries (Jing, et al., 2020). Dumpling has become a staple food in China because of the rapidly growing frozen food industry (Jing, et al., 2020). The main ingredient in making

dumpling wrappers is wheat flour (Jing, et al., 2020). High-quality dumpling wrappers are evenly hydrated, smooth surfaced, white or milky white in appearance, elastic and extensible, with low stickiness (Jing, et al., 2020).

In Malaysia, various ethnic traditional foods were introduced in the form of cook-chilled and cook- frozen systems. This includes Chinese dumplings, mochi, kimchi, ramen, kimbap, and others. Today, dumpling is eaten year-round because of the rapidly growing frozen food industry (Jing, et al., 2020). Dumplings can be served in many ways such as steaming, pan- boiling, boil and deep fat frying (Jing, et al., 2020). The ability to serve at a different time of meal such as an appetizer, side dish, or main course with any dipping sauce likes vinegar, soy sauce, garlic, ginger, and a spicy element sauce makes people like to consume it (Jing, et al., 2020). Usually, the dumpling filling is made from pork or minced meat, or chicken and is quite costly (Wei, 2022).

The reason why this product is made is due to most of the dumpling filling products in the market were made from animals based, are expensive, and take a longer time to be digested in the human body (Lilis, 2019). With increasing of health concerned consumers and vegetarian demand for plant-based filling, jackfruit straw dumpling filling was introduced as it is pretty much containing only two macronutrients: protein and fat (Lilis, 2019). This high value-added (fruit waste-based) innovative product is expected able to fulfill customer demand as people nowadays are focusing on functional foods, convenience foods, food ingredients, and halal foods (Brown & McEnally, 1993). It is proven as the consideration of all convenience aspects are highlighted such as time spent, physical energy, and mental effort saving related to food preparation and consumption (Brown & McEnally, 1993). The cost-effectiveness and ease of preparing this filling make this product able to be produced in mass production and it is recommended for those who wish the simple and hearty products to consume it.

Having a proper treatment to the jackfruit straw, enable it to be the main ingredient to produce the dumpling filling. Based on recent observations and some research made, reducing production and sales costs by using wastage are the main purposes of this product innovation as well as to fulfil the Malaysia Sustainable Development Goals 2015-2030 (12th Goal of the SDG) issued by the government.

2. MATERIAL & METHODOLOGY

2.1 Materials

Jackfruit straws were gathered from local suppliers. Other community ingredients were obtained from oriental kitchen, Faculty of Hotel and Tourism Management, Universiti Teknologi MARA Terengganu Branch, Dungun Campus. Table 1 displays the ingredients and proportions required for dumpling with jackfruit straw dendeng filling in percentage formulation.

Table 1. Formulation of dumpling dendeng

Ingredients	Percentage (%)
Soft flour	12.58
Bestari flour	19.65
Jackfruit straw	19.65
Onion	6.29
Shallot	9.43
Garlic	3.14
Ginger	1.57
Chilies paste	4.72
Lemongrass	3.14

Galangal	7.86
Tomatoes	7.08
Sweet soy sauce	4.87
Total	100

Variations:

Variation 1 - Frying jackfruit straw with flour

Variation 2 - Frying jackfruit straw without flour

Variation 3 - Baked jackfruit straw

2.2 Methodology

The process of making dumpling with jackfruit straw dendeng filling has been illustrated in Figures 1, 2, and 3.

	1. Treat the jackfruit straw with brine water for overnight.
	2. Bake/ or fry jackfruit straw at appropriate temperatures and times.
	3. Sauté remaining ingredients until smell fragrance aroma and slightly golden brown.
	4. Add treated jackfruit straw into sauté paste. Stir and season it well.

Figure 1. Preparation of Dendeng Jackfruit Straw Filling.

	1. Mix all dry ingredients. Then using the rub-in method technique mix the mixture of ingredients with the water.
	2. Knead the dough until elastic. Rest for 30 minutes.
	3. Roll the dough and cut it into round shape.

Figure 2. Preparing dumpling dough.

	1. Place filling in the centre of the round-shaped dough.
	2. Using appropriate tools, shape the dough into dumpling shaped.

	3. Pre-steam for a few minutes until cooked.
	1. Cool the dumpling for a few minutes. Then arrange in the vacuum packaging.
	2. Vacuum the product by removing the air in the packaging.
	3. Vacuum-packed product. Ready to market.

Figure 4. Packing the product.

2.3 Scorecard

A scorecard was developed based on a consumer preference test as an instrument to assess the consumer preferences with 3 different variations, variation 1 - frying jackfruit straw without flour, variation 2 - baked jackfruit straw, and variation 3 - frying jackfruit straw with flour. A 7-point of hedonic scale where used starting from a scale of 1 (extremely dislike) to a scale of 7 (extremely like) by panelists to evaluate the samples. Three samples are given to each panel, and each sample is identified by a three-digit number. The panel has to evaluate aroma, texture, appearance, flavor, thickness of filling, combination of skin and filling, and overall acceptance.

3. FINDINGS

The result of sensory evaluation comprises aroma, texture, appearance, flavor, thickness of filling, combination of skin and filling, and overall acceptance is presented in Table 2. A consumer preference test with 7 scales was conducted to determine consumer preferences between three different samples (V1, V2 & V3). They were 30 untrained panels were involved in this evaluation. Overall acceptability indicates the majority of the panels preferred V2 (frying jackfruit straw) with a 4.9 mean score followed by V3 with a 4.8 mean score (baking jackfruit straw) and lastly V1 with a 4.7 mean score (frying jackfruit straw with flour).

Table 2. The sensory evaluation results of dumpling with jackfruit straw dendeng filling

Characteristics	Variation 1	Variation 2	Variation 3
Aroma	4	5	5
Texture	4.6	5	5
Appearance	4.6	5.1	5.2
Flavor	4.8	4.9	4.7
Thickness of filling	5.1	5.3	5.1
Combination of skin and filling	4.7	5	5
Overall Acceptability	4.7	4.9	4.8

3.1 Product Characteristic



Figure 5. Packaging of dumpling with jackfruit filling.

The product produced was ready-to-eat food. It is pre-cooked food and can be reheated using a microwave oven for less than 1 minute or consumed as it is. The vacuum pack method was chosen for product packaging. The method of removing air from a pack before sealable to prevent the growth of bacteria and microbes and later prolong product shelf life (Gorris & Peppelenbos, 1992).

4. DISCUSSION

There is abundant production of food waste during processing the of raw agricultural products to finished products. Some of these wastes end up as animal feed and some are returned to the land as a nutrient (Akter & Haque, 2019). The jackfruit straw part has not been properly utilized. These foods are high in fibre and can be processed as food even though the colour of the jackfruit straw

is one of the weaknesses of its attribute (Sayuti et al., 2015). Based on the observation, the aroma, texture, appearance, flavor, thickness of filling, combination of skin and filling, and overall acceptance of the dumpling with frying jackfruit straw were most preferred by the panellists compared to other variations, as the filling was less oily, crunchier and more aromatic.

5. CONCLUSION

A proper methodology and treatment of the ingredient enable waste ingredients to be commercialized and increased the value added in traditional Chinese dumplings (plant-based). The product is cost-effective as a waste ingredient was used compared to existing (animal-based). Further studies can be carried out to study physicochemical properties and proximate analysis. Through these further studies, it can compare the actual nutrient value of Jackfruit straw floss with other floss in the market.

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