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Dear Sir/Madam,

I am writing to submit our manuscript entitled **Development, Market Research and Cost Analysis of Fried Shallot as Local Superior Product in Semau Island, East Nusa Tenggara, Indonesia.**

Please see the attachment documents those are cover letter, manuscript submission and the manuscript.

Thank you for your consideration

Sincerely,  
Dr. Diyah Tulipa  
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# **Development, Market Research and Cost Analysis of Fried Shallot as Local Superior Product in Semaui Island, East Nusa Tenggara, Indonesia**

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**Abstract:** The purpose of this research is to determine Local Superior Product in Semaui Island, a small island in East Nusa Tenggara province, Indonesia. Food product development based on the local agricultural commodities with appropriate technology to the local society in Semaui island is an important effort to improve the socio economic development. Shallot is one of the main agricultural commodities in Semaui Island. Based on several criteria such as the applied technology, human resources, market potential, and economic contribution, fried shallot has potential as a Local Superior Product from Semaui. In this research, fried shallot has been developed in laboratory scale and then subjected to the chemical analysis, market test and feasibility analysis on the economic aspect. Processing steps of fried shallot are peeling, slicing, mixing, frying and packaging. Results of the chemical analysis showed that moisture and fat contents of the product were comparable to the commercial fried shallot. In the market test, purchase intention of the product was high enough. Cost analysis showed that the contribution margin ratio was 107%. Based on the technical and economic evaluation, the production of fried shallot was feasible to be implemented in Semaui island.

**Keywords:** fried shallot, Semaui island, market, cost analysis

## **1. Introduction**

Agriculture sector is an important and strategic sector in the Indonesia development structure. Indonesian agriculture has contributed significantly to Indonesia's growth, employment and reduction of poverty. Most of the Indonesian people depend on the agriculture sector (Ellitan, 2017). Hence, development of agriculture sector will contribute significantly in the local and regional development. The challenge in the agriculture sector development is to provide long run sustainability with focus on farmer income. There are an estimated 24 million hectares of dryland areas whose potential is yet to be developed. Semaui island (Figure 1) is one of dryland area with rural households whose heavily dependent on agriculture because non-farm rural economies are less robust.

Semaui island is located in Kupang District, Province of East Nusa Tenggara. The island is divided into 2 sub-districts i.e. Semaui sub-district with 143.42 km<sup>2</sup> area, 8 villages; and Southern Semaui with 153 km<sup>2</sup> area, 6 villages. The originated name of Semaui island is Nusa Bungtilu which mean island of flower in three colours represented 3 tribes i.e. Helong tribe (represented by white), Timor tribe (represented by red) and Rote tribe (represented by black). Semaui island has big potency as tourism area since there are 5 beautiful beaches i.e. Liman, Otan, Onanbalu, Uih Make, and Uitiuhtuan. However the beaches are still quiet, there is not many tourists and lack of facilities. The tourists should prepare the accommodation for their tourism in Kupang.

Based on the situation, development of higher economic value food product based on local agriculture commodities is a key success factor to contribute in improving the farmer incomes in the areas. Most of Semaui island people is farmer with horticulture commodities i.e. shallot, mango, papaya and cashew. Developing Local Superior Product is seen as a way to increase community income. Local Superior Product is made by utilizing local resources and knowledge (material and human), creating value adding activities, and branding local products. Shallot is main agricultural commodity that has potential as a Local Superior Product. They harvest shallot twice a year. The farmers usually sell the harvested commodity directly with unstable price. In order to increase income, it is necessary to add value from raw onion commodity to fried shallots product.

Shallot (*Allium cepa* L.) is an onion type widely used to improve taste and aroma of food products, in which the sulphure compounds as the main contributor. The flavor compounds are produced from their precursors i.e. S-alk(en)yl-L-cysteine sulfoxides which was hydrolyzed by alliinase into pyruvate, ammonia and volatile and non-volatile sulphure compounds. This reaction occurs when the shallot tissue damage caused by processing such as cutting and cooking. Shallot is also source of phytochemical such as flavonoid, fructooligosaccharide and thiosulphinate (Schwimmer and Weston, 1961; Bacon et al., 1999; Prakash et al., 2007; Slimestad et al., 2007; Pérez-Gregorio et al., 2010; Benítez et al., 2011).

Shallot, like other agricultural commodities in general, is a perishable food material. Shallot processing become various products can add its economic value and prolong the shelf life. Fried shallot is a shallot product with wide market share, domestic and overseas (Herman, 2007). In general, the processing steps are peeling, washing, cutting, frying and packaging (Anonim, 2008). Shallot variety and quality determine the fried shallot characteristic (Herman, 2007). Frying is a critical point in the processing, hence the frying oil quality should be controlled since it determine the product shelf life (Alam et al., 2014).

Fried shallots are a type of food that has been widely known in Indonesia both as a side dish and as a seasoning. Therefore, when introducing products to the market there is no need to introduce the type of product. The important thing to do is to introduce the unique characteristics of fried shallots from Semaui. The key of marketing is positioning, differentiation and branding (Kotler and Keller, 2011). Positioning is the way the company determines the target market that involves the identification the most profitable market segment. A target marketing strategy is focus on customer's need and wants. The company is offer the unique product to satisfy the customers that lead the company to use differentiation strategy. Branding is a strategic point of view to create customer value. It is about the management of product image, how to communicate the good of the product to consumers.

There three basic things that can be done in marketing for this study, those are (1) creating a brand in the form of a product name or symbol that is a product or regional characteristic, (2) use packaging as a product identification, to competing products that have both of visual appeal and are able to protect contents, (3) communicate the products to consumers by offering products directly to consumers through social media and regional product outlets.

Product readiness and its features need to be assessed for its feasibility to be commercialized. Feasibility studies can be done through calculating production costs that can show if the products bring benefits when its produced on a small and medium scale industry. There for the objective of this research was to develop fried shallot in Semaui island and its feasibility analysis as an effort in improving farmer income.

## **2. Materials and Methods**

### **2.1. Materials**

Fresh shallot obtained from Semaui island. Rice flour, salt and frying oil purchased from local market. Analytical grade chemicals purchased from local distributor.

## **2.2. Semaui fried shallot processing and chemical analysis**

Semaui shallot was peeled, sliced, mixed with salt and rice flour, fried and packed in polypropylene pouch zip lock standing and polyethylene terephthalate jar packaging. The Semaui fried shallot was subjected to chemical analysis i.e. proximate composition (moisture, ash, fat and protein contents) by using standard method AOAC and mineral content (Calcium, Potassium, Sodium and Iron) with Atomic Absorption Spectrophotometer.

## **2.3. Market research**

There are three basic things that can be done in marketing for this study, those are (1) creating a brand in the form of a product name or symbol that is a product or regional characteristic, (2) use packaging as a product identification, to competing products that have both of visual appeal and are able to protect contents, (3) communicate the products to consumers by offering products directly to consumers through social media and regional product outlets.

Packaging is designed to its function as product identification, visual appeal and protect product contents from outer air contamination so that the product is more durable and not damaged quickly. The packaging for fried shallots were plastic pouch and jar. Product name and description of the product printed on the sticker and embedded to the plastic pouch or jar. After conducting a packaging study, the next step was to conduct market research.

This market research aim was to determine product positioning. Market research was carried out in two stages. The first stage was before the production of fried shallots. The objective was to find out consumer preferences for onion products in terms of taste, texture, shape, color and price. The results of the initial survey in the form of product attributes will be used to produce fried shallots. The second stage of market research was conducted after fried shallot produced, packaged and suitable for commercialization. The survey was conducted to explore respondents' responses after tasting fried shallot.

## **2.4. Cost analysis**

The decision making process requires data that can be measured, properly analyzed and made possible. In decision making there is no general rule that distinguishes costs into relevant or irrelevant costs, therefore to find out which are the relevant costs, a cost analysis is needed which includes the following steps (Mowen, Hansen, and Heitger, 2016: 574- 578):

- a) Collect all costs related to each alternative considered.
- b) Eliminating sunk costs.
- c) Eliminating costs that do not differ between alternatives considered.
- d) Draw conclusions based on other remaining cost data, which are different costs.

## **3. Results and Discussion**

### **3.1. Semaui fried shallot**

Figure 2 show the Semaui shallot and fried shallot packed in plastic pouch and jar. The proximate and mineral composition is presented in Table 1. Moisture content is a key parameter of fried shallot quality, which affect on the product crispness and shelf life. Moisture content of the fried shallot (3.11%) was comparable to that of commercial Palu fried shallot reported by Alam et al. (2014) which in a range of 2.57-4.40%.

In general, fat content is an important parameter of fried food. Fat contribute to aroma, taste and appearance of fried food, but it is susceptible to oxidation reaction so it become a critical parameter of fried food shelf life. On nutritional aspect, amount of fat contribute to the calorie content. The Semaui fried shallot was slightly oily in appearance, savory taste and aroma. Its fat content was lower than that of Palu fried shallot (36.92-42.51%) as reported by Alam et al. (2014). On nutritional aspect, it can be estimated that consuming 100 g of Semaui fried shallot will give 30.35% contribution to the fat daily value.

Ash content reflects total mineral amount in a food. The Semau fried shallot contain ash of 5.99%. It depend on the mineral content of ingredients used in the formula i.e. shallot, rice flour and salt. Calsium, potassium and sodium are the essential minerals for human body with requirement > 50 mg. Sodium overconsumption can lead to blood tension increasing. Though iron requirement is lower than those minerals, it is essentialin haemoglobin, mioglobin and various enzymes such as peroxidase and catalase production (Berdanier *et al.*, 2007; Hounsone *et al.*, 2008; Belitz *et al.*, 2009; Sriantha et al., 2012). Consuming 100 g of Semau fried shallot can contribute to calcium, potassium, sodium and iron body requirement of 0.06%, 0.01%, 0.05% and 0.38%, repectively.

Shallot is not a protein source, but the product contain protein of 3.44%. The rice flour may be give a significant contribution to the protein content. Carbohydrate by difference of the fried shallot was 67.74%. It might be consist of fiber from shallot and starch from the rice flour.

### 3.2. Market research

First stage market research was conducted to explore consumers' preferences for fried shallot. Respondent is selected based on their special knowledge about fried shallot. Most of respondents are female, workers and have monthly income less than 10 million rupiahs (about USD 690). The preferences about fried shallot characteristic for the texture is tin and crunchy, the form is oval, the color is bright brown, the fragrant is sweet-scented, and the taste is salty. Most respondent inquiry the price for 100 gram fried shallot was Rp.7.500 (about USD 50 cent / 100 gram). The order of importance for the fried shallot characteristic was price, taste, color, fragrant, form and texture.

After fried shallot produce based on consumers' preferences then the second market research was conducted. The aim of the second market research was to explore respondents' responses after tasting fried shallot. Most of respondents were female, range of age from 35 to 54 years old, workers, have monthly income less than 10 million rupiahs (about USD 690) and as end user for domestic needs. Respondents usually buy fried shallot package of 100 gram with regular price 10,000 rupiah (about USD 75 cent). Respondent response for Semau's Fried Shallot is shown in Table 2.

Overall the respondents' assessment of Semau fried shallot was 3.52 that means the respondents agreed to the statements in the questionnaire. The implication of the respondents assessed is the qualifications and specifications of Semau fried shallot was fit with consumers' expectation. The distribution of respondents' perception about Semau fried shallot is shown in Table 3.

T

### 3.3. Cost Analysis

The aim of cost analysis for the Semau fried shallot was to analyze the additional benefits that can be received by shallot farmers when processing fried shallot products. Raw onion as much as 2 kg will produce 700 gram fried shallots. Based on consumer expectation consumer usually buy fried shallot package of 100 gram and willing to pay it for 10,000 rupiahs (about USD 75 cent). Table 4 show the cost of production and additional revenue when the farmers produce fried shallots.

The additional revenue for farmers when they produce 2 kg of raw shallot is Rp. 42,945 or 107.36%. Therefore, farmers have an alternative to process shallots into fried shallots. The cost of production does not include transportation cost into account, because transportation costs or shipping costs is paid by consumers.

## 4. Conclusion

Results of the chemical analysis showed that moisture and fat contents of the product were comparable to the commercial fried shallot. In the market test, purchase intention of the product

was high enough. Cost analysis on economic aspect showed that the contribution margin ratio was 107%. Based on the technical and economic evaluation, the production of fried shallot was feasible to be implemented in Semaui island.

## 5. Conflict of interest

All authors declare that no conflict of interest

## 6. Acknowledgement

We thank to Widya Mandala Catholic University Surabaya for financial support through Interdisciplinary Research Grant 2018 with contract number of 1001 /WM01/N/2018

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**Table 1. Proximate and mineral composition of Semau fried shallot**

Chemical compound	Content
Moisture	3.11%
Ash	5.99%
Protein	3.44%
Fat	19.73%
Carbohydrate (by difference)	67.74%
Calcium	0.5668 mg/100 g
Potassium	0.2763 mg/100 g
Sodium	1.2778 mg/100 g
Iron	0.1096 mg/100 g

**Table 2. Semau's Fried Shallot Attribute**

Description	N	Min	Max	Mean	SD
<b>Taste</b>					
1 Savory	50	2	5	4,10	0,678
2 Salty	50	1	5	3,90	0,931
3 Fit with respondent taste	50	1	5	3,84	0,912
Price 10,000 rupiahs/ 100 gram (about USD 75 cent)					
4 Fair	50	2	5	3,80	0,833
5 More expensive among competitors	50	1	5	2,82	0,941
<b>Color</b>					
6 Bright Brown	50	2	5	3,68	0,868
7 Not burning	50	1	5	2,40	1,088
8 The color is Interesting	50	2	5	3,54	0,838
<b>Texture</b>					
9 Tin and Crunchy	50	2	5	3,88	0,824
10 Fit with respondent expectation	50	2	5	3,80	0,904
<b>Aroma</b>					
11 Sweet-scented	50	2	5	3,96	0,807
12 Arousing Intention to buy	50	2	5	3,86	0,783

Chopping Shape						
13	Oval (whole)	50	1	5	2,80	0,990
14	Irregular form of Chopping	50	1	5	3,50	0,953
15	Crushed	50	1	5	2,94	1,077

Source: data processed

**Table 3. The respondents' perception about Semau Fried Shallot**

Description		Strongly disagree	Disagree	Netral	Agree	Strongly Agree
<b>Taste</b>						
1	Savory	0 (0%)	1 (2%)	6 (12%)	30 (60%)	13 (26%)
2	Salty	1 (2%)	3 (6%)	9 (18%)	24 (28%)	13 (26%)
3	Fit with respondent taste	1 (25%)	3 (6%)	10 (20%)	25 (50%)	11 (22%)
Price 10,000 rupiahs/ 100 gram (about USD 75 cent)						
4	Fair	0 (0%)	5 (10%)	8 (16%)	29 (58%)	8 (16%)
5	More expensive among competitors	2 (4%)	19(38%)	17(34%)	10(20%)	2 (4%)
<b>Color</b>						
6	Bright Brown	0 (0%)	7(%)	8(%)	19(%)	6(%)
7	Not burning	8 (16%)	26 (52%)	7 (14%)	6 (12%)	3 (6%)
8	The color is Interesting	0 (0%)	4 (8%)	22 (44%)	17 (34%)	7 (14%)
<b>Texture</b>						
9	Tin and Crunchy	0 (0%)	4 (8%)	8 (16%)	28 (56%)	10 (20%)
10	Fit with respondent expectation	0 (0%)	5 (10%)	11 (22%)	23 (46%)	11 (22%)
<b>Aroma</b>						
11	Sweet-scented	0 (0%)	3 (6%)	8 (16%)	27 (54%)	12 (24%)
12	Arousing Intention to buy	0 (0%)	2 (4%)	13 (26%)	25 (50%)	10 (20%)
<b>Chopping Shape</b>						
13	Oval (whole)	1 (2%)	25 (50%)	9 (18%)	13 (26%)	2 (4%)
14	Irregular form of chopping	1 (2%)	8 (16%)	11 (22%)	25 (50%)	5 (10%)
15	Crushed	4 (8%)	16 (32%)	11 (22%)	17 (34%)	2 (4%)

Source: data processed

**Table 4. Additional Revenue for fried shallot production**

Onion		Fried shallot		Incremental
Onion 2 kg	Rp 40,000	Onion 2 kg	Rp 40,000	Rp 0
		Cost of production for 700 gram	(27,055)	(27,055)
		Sales	70,000	70,000
	Rp 40,000		Rp 82,945	Rp 42,945

Source: data processed





Figure 1. Semau Island in Indonesia Map



Figure 2. Semau Shallot and Semau Fried Shallot

July 9, 2019

Prof. Dr. Son Radu  
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Dear Sir/Madam,

#### **COVER LETTER FOR MANUSCRIPT SUBMISSION TO FOOD RESEARCH**

I am writing to submit a manuscript for consideration of publication in Food Research. The title of manuscript is **Development, Market Research and Cost Analysis of Fried Shallot as Local Superior Product in Semaui Island, East Nusa Tenggara, Indonesia**. This manuscript has not been previously published and has not currently under consideration by any others journal.

This is the first study that discusses the processing, nutrition composition analysis, market research and cost analysis of Semaui Fried Shallot. We processed the product from Semaui shallot, a superior commodity in Semaui Island, East Nusa Tenggara – Indonesia. The result of the study that based on the technical analysis and economic evaluation, the production of fried shallot was feasible to be implemented in Semaui Island

We believe the manuscript would interest readers of the journal as the product development and analysis are interesting and clearly demonstrated.

We would like to suggest the following potential reviewers that have the expertise to evaluate our findings and interpretation objectively.

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4. Sri Palupi Prabandari, SE, MM, PhD (Business, Entrepreneurship) email: [palupi@ub.ac.id](mailto:palupi@ub.ac.id)

Thank you very much for your consideration.

Sincerely,



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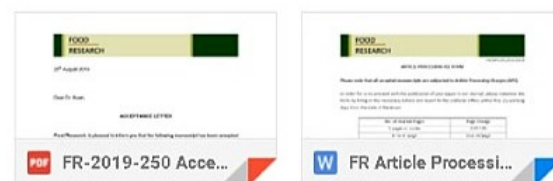
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9<sup>th</sup> July 2019

Authors: Diyah Tulipa, Dyna Rachmawati, Lenna Elitan and Ignatius Srianta

Manuscript title: Development, Market Research and Cost Analysis of Fried Shallot as Local Superior Product in Semau Island, East Nusa Tenggara, Indonesia

Manuscript ID: FR-2019-250

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General comments - The manuscript is written non-systematically and vaguely. Readers are likely to be confused with the main purpose of the research.

The following is the detailed comments for the manuscript.

1. The objective of the manuscript - The purpose of the research stated is not clear and different from the research.
2. You might be confused with the shallots and onions. Shallots and onions are different, although shallots come from the onion family. Overall manuscript gave an impression that the fried shallots were produced from onions. Please clarify in the manuscript.
3. Since the shallots used are from Semau Island, there is no need for the word 'Semau fried shallots' as there is no comparison in between products. Suggest to only use fried shallots throughout the manuscript.
4. Materials and methods - Please rearrange the sequence. Market research was conducted first. Not the production of fried shallots. No input/description of how the consumer survey in the market research was conducted. Please add in.
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Dear Dr. Vivian,

Thank you for the review of our article. We had revised the article as suggested. The revised article and the response to editor comments and suggestion are attached. Thank you very much for your kindly support.

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Best Regards,  
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# Market research and cost analysis of production of fried shallot as local superior product in Semau Island, East Nusa Tenggara, Indonesia

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## Abstract:

The purpose of this research was to perform a market research and cost analysis of the fried shallots production. Food product development based on the local agricultural commodities with appropriate technology to the local society in Semau island is an important effort to improve socio-economic development. Shallot is one of the main agricultural commodities in Semau Island. Based on several criteria such as the applied technology, human resources, market potential, and economic contribution, fried shallot has potential as a Local Superior Product from Semau. In this research, fried shallot was developed at laboratory scale and subjected to the chemical analysis, market test and feasibility analysis on the economic aspect. The processing steps of fried shallot include peeling, slicing, mixing, frying and packaging. The results of the chemical analysis showed that moisture and fat contents of the product were comparable to the commercial fried shallot. In the market test, the purchase intention of the product was high enough. Cost analysis showed that the contribution margin ratio was 107%. Based on the technical and economic evaluation, the production of fried shallot was feasible to be implemented in Semau island.

**Keywords:** Fried shallot, Semau island, Market, Cost analysis

## 1. Introduction

The agriculture sector is an important and strategic sector in the Indonesia development structure. Indonesian agriculture has contributed significantly to Indonesia's growth, employment and reduction of poverty. Most of the Indonesian people depend on the agriculture sector (Ellitan, 2017). Hence, the development of agriculture sector will contribute significantly to the local and regional development. The challenge in the agriculture sector development is to provide long-run sustainability with focus on farmer income. There are an estimated 24 million hectares of dryland areas whose potential is yet to be developed. Semau island (Figure 1) is one of dryland area with rural households whose heavily dependent on agriculture because non-farm ruraleconomies are less robust.

Semau island is located in Kupang District, Province of East Nusa Tenggara. The island is divided into 2 sub-districts i.e. Semau sub-district with 143.42 km<sup>2</sup> area, 8 villages; and Southern Semau with 153 km<sup>2</sup> area, 6 villages. The originated name of Semau island is Nusa Bungtilu which mean island of flower in three colors represented 3 tribes i.e. Helong tribe (represented by white), Timor tribe (represented by red) and Rote tribe (represented by black). Semau island has big potency as tourism area since there are 5 beautiful beaches i.e. Liman, Otan, Onanbalu, Uih Make, and Uitiuhtuan. However, the beaches are still quiet, there is not many tourists and lack of facilities. The tourists should prepare the accommodation for their tourism in Kupang.

Based on the situation, the development of higher economic value food product based on local agriculture commodities is a key success factor to contribute to improving the farmer incomes in the areas. Most of Semau island people are farmer with horticulture commodities i.e. shallot, mango, papaya and cashew. Developing Local Superior Product is seen as a way to increase community income. Local Superior Product is made by utilizing local resources and knowledge (material and human), creating value-added activities, and branding local products. Shallot is main agricultural commodity that has potential as a Local Superior Product. They harvest shallot twice a year. The farmers usually sell the harvested commodity directly with unstable price. In order to increase income, it is necessary to add value from raw shallots commodity to fried shallots product.

Shallot (*Allium cepa* L.) is an onion type widely used to improve the taste and aroma of food products, in which the sulfur compounds as the main contributor. The flavor compounds are produced from their precursors i.e. S-alk(en)yl-L-cysteine sulfoxides which were hydrolyzed by alliinase into pyruvate, ammonia and volatile and non-volatile sulfur compounds. This reaction occurs when the shallot tissue damage caused by processing such as cutting and cooking. Shallot is also source of phytochemical such as flavonoid, fructooligosaccharide and thiosulphate (Schwimmer and Weston, 1961; Bacon *et al.*, 1999; Prakashet *al.*, 2007; Slimstadet *al.*, 2007; Pérez-Gregorio *et al.*, 2010; Benítez *et al.*, 2011).

Shallot, like other agricultural commodities in general, is a perishable food material. Shallot processing becomes various products can add its economic value and prolong the shelf life. Fried shallot is a shallot product with wide market share, domestic and overseas (Herman, 2007). In general, the processing steps are peeling, washing, cutting, frying and packaging (Anonim, 2008). Shallot variety and quality determine the fried shallot characteristic (Herman, 2007). Frying is a critical point in the processing, hence the frying oil quality should be controlled since it determines the product shelf life (Alamet *al.*, 2014).

Fried shallots are a type of food that has been widely known in Indonesia both as a side dish and as a seasoning. Therefore, when introducing products to the market there is no need to introduce the type of product. The important thing to do is to introduce the unique characteristics of fried shallots from Semau. The key of marketing is positioning, differentiation and branding (Kotler and Keller, 2011). Positioning is the way the company determines the target market that involves the identification the most profitable market segment. A target marketing strategy is focused on customer's need and wants. The company offers a unique product to satisfy the customers that lead the company to use differentiation strategy. Branding is a strategic point of view to create customer value. It is about the management of product image, how to communicate the good of the product to consumers.

There are three basic things that can be done in marketing for this study, those are (1) creating a brand in the form of a product name or symbol that is a product or regional characteristic, (2) use packaging as a product identification, to competing products that have both of visual appeal and are able to protect the contents, (3) communicate the products to consumers by offering products directly to consumers through social media and regional product outlets.

Product readiness and its features need to be assessed for its feasibility to be commercialized. Feasibility studies can be done through calculating production costs that can show if the products bring benefits when it's produced on a small and medium scale industry. Therefore,

the objective of this research was to perform a market research and cost analysis of the fried shallots production an effort to improve farmer income.

## **2. Materials and methods**

### ***2.1. Primary Market Research***

There are three basic things that can be done in marketing for this study, those are (1) creating a brand in the form of a product name or symbol that is a product or regional characteristic, (2) use packaging as a product identification, to competing products that have both of visual appeal and are able to protect contents, (3) communicate the products to consumers by offering products directly to consumers through social media and regional product outlets.

Packaging is designed to its function as product identification, visual appeal and protection of product contents from outer air contamination so that the product is more durable and not damaged quickly. The packaging for fried shallots was a plastic pouch and jar. Product name and description of the product printed on the sticker and embedded to the plastic pouch or jar. After conducting a packaging study, the next step was to conduct market research.

This market research aim was to determine product positioning. Market research was carried out in two stages. The first stage was before the production of fried shallots. The objective was to find out consumer preferences for fried shallots. Respondents are the people who have special knowledge about fried shallot, buys fried shallots for their own consumption and restaurant owner who use fried shallot as a complementary food such as soto, meatballs and fried rice or other foods. Another consideration for selecting respondents is people who often make their own fried shallots. Attributes product of fried shallots includes form, color, texture, aroma, taste and possibility of selling price is questioned to respondents. The results of the primary research market in the form of product attributes will be used to produce the Semaui fried shallots.

### ***2.2. Materials***

Fresh shallot was obtained from Semaui island. Rice flour, salt and frying oil were purchased from the local market. Analytical grade chemicals were purchased from a local distributor.

### ***2.3. Semaui fried shallot processing and chemical analysis***

Semaui shallot was peeled, sliced, mixed with salt and rice flour, fried and packed in polypropylene pouch zip lock standing and polyethylene terephthalate jar packaging. The Semaui fried shallot was subjected to chemical analysis i.e. proximate composition (moisture, ash, fat and protein contents) by using standard method AOAC and mineral content (Calcium, Potassium, Sodium and Iron) with Atomic Absorption Spectrophotometer (AOAC, 2003).

### ***2.4. Secondary Market research***

The second stage of market research was conducted after the production of Semaui fried shallots suitable for commercialization. The survey was conducted to explore respondents' responses after tasting fried shallot. This market research involved broader respondent not only respondent who have special knowledge for fried shallots but also respondent who have willingness to buy fried shallots or potential consumers.

### ***2.5. Cost analysis***

The decision-making process requires data that can be measured, properly analyzed and made possible. In decision making there is no general rule that distinguishes costs into relevant or irrelevant costs, therefore to find out which are the relevant costs, a cost analysis is needed which includes the following steps (Mowen *et al.*, 2016):

- a) Collect all costs related to each alternative considered.
- b) Eliminating sunk costs.

- c) Eliminating costs that do not differ between alternatives considered.
- d) Draw conclusions based on other remaining cost data, which are different costs.

### 3. Results and discussion

#### 3.1. Primary Market Research

First stage market research was conducted to explore consumers' preferences for fried shallot. This study involved respondents who have selected based on their special knowledge about fried shallot. Most of respondents are female, workers and have monthly income less than IDR 10 million (about USD 690). The preferences about fried shallot characteristic for the texture is thin and crunchy, the form is oval, the color is bright brown, the fragrant is sweet-scented, and the taste is salty. Most respondent inquiry the price for 100 g fried shallot was IDR 7.500 (USD 0.50/100 g). The order of importance for the fried shallot characteristic was price, taste, color, aroma, form and texture.

#### 3.2. Fried Shallot production

Figure 2 shows the Semaui shallot and fried shallot packed in plastic pouch and jar. The proximate and mineral composition is presented in Table 1. Moisture content is a key parameter of fried shallot quality, which affects on the product crispness and shelf life. Moisture content of the fried shallot (3.11%) was comparable to that of commercial Palu fried shallot reported by Alam *et al.* (2014) which is in a range of 2.57-4.40%.

In general, fat content is an important parameter of fried food. Fat contributes to aroma, taste and appearance of fried food, but it is susceptible to oxidation reaction so it becomes a critical parameter of fried food shelf life. On nutritional aspect, amount of fat contributes to the calorie content. The Semaui fried shallot was slightly oily in appearance, savory taste and aroma. Its fat content was lower than that of Palu fried shallot (36.92-42.51%) as reported by Alam *et al.* (2014). On nutritional aspect, it can be estimated that consuming 100 g of Semaui fried shallot will give 30.35% contribution to the fat daily value.

Ash content reflects the total mineral amount in food. The Semaui fried shallot contains 5.99% due to the mineral content of ingredients used in the formula i.e. shallot, rice flour and salt. Calcium, potassium and sodium are the essential minerals for human body with requirement > 50 mg. Sodium overconsumption can lead to blood tension increasing. Though iron requirement is lower than those minerals, it is essential in hemoglobin, myoglobin and various enzymes such as peroxidase and catalase production (Berdanier *et al.*, 2007; Hounsomer *et al.*, 2008; Belitz *et al.*, 2009; Srianta *et al.*, 2012). Consuming 100 g of Semaui fried shallot can contribute to calcium, potassium, sodium and iron body requirement of 0.06%, 0.01%, 0.05% and 0.38%, respectively.

Shallot is not a protein source, but the product contains 3.44% protein. The rice flour may contribute significantly to the protein content. The carbohydrate by difference of the fried shallot was 67.74% which could be from the fiber from shallot and starch from the rice flour.

#### 3.2. Secondary Market research

The secondary market research was conducted after fried shallot is produced. The aim of the second market research was to explore respondents' responses after tasting the fried shallot. Most of respondents were female, range of age from 35 to 54 years old, workers, have monthly income less than IDR 10 million (USD 690) and as end-user for domestic needs. Respondents usually buy fried shallot package of 100 g with regular price IDR 10,000 (USD 0.75). The responses for the market analysis of Semaui's Fried Shallot are shown in Table 2.

Overall the respondents' assessment of Semaui fried shallot was 3.52 that means the respondents agreed to the statements in the questionnaire. The implication of the respondents assessed is the qualifications and specifications of Semaui fried shallot was fit

with consumers' expectation. The distribution of respondents' perception of Semaui fried shallot is shown in Table 3.

### 3.3. Cost analysis

The aim of cost analysis for the Semaui fried shallot was to analyze the additional benefits that can be received by shallot farmers when processing fried shallot products. Raw onion as much as 2 kg will produce 700 g fried shallots. Based on consumer expectation consumer usually, buy fried shallot package of 100 g and willing to pay it for IDR 10,000 (USD 0.75). Table 4 shows the cost of production and additional revenue when the farmers produce fried shallots. The additional revenue for farmers when they produce 2 kg of raw shallot is IDR 42,945 or 107.36%. Therefore, farmers have an alternative to process shallots into fried shallots. The cost of production does not include transportation cost into account, because transportation/shipping cost is paid by consumers.

## 4. Conclusion

The results of the chemical analysis showed that moisture and fat contents of the product were comparable to the commercial fried shallot. In the market test, purchase intention of the product was high enough. Cost analysis on economic aspect showed that the contribution margin ratio was 107%. Based on the technical and economic evaluation, the production of fried shallot was feasible to be implemented in Semaui island.

## Conflict of interest

All authors declare that no conflict of interest

## Acknowledgement

We thank to Widya Mandala Catholic University Surabaya for financial support through Interdisciplinary Research Grant 2018 with contract number of 1001 /WM01/N/2018

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Figure 1. Semau island in Indonesia map



Figure 2. Semaui shallot and Semaui fried shallot

Table 1. Proximate and mineral composition of Semaui fried shallot

Chemical compound	Content
Moisture	3.11%
Ash	5.99%
Protein	3.44%
Fat	19.73%
Carbohydrate (by difference)	67.74%
Calcium	0.5668 mg/100 g
Potassium	0.2763 mg/100 g
Sodium	1.2778 mg/100 g
Iron	0.1096 mg/100 g

Table 2. Attributes of Semaufried shallot

Description		N	Min	Max	Mean	SD
<b>Taste</b>						
1	Savory	50	2	5	4,10	0,678
2	Salty	50	1	5	3,90	0,931
3	Fit with respondent taste	50	1	5	3,84	0,912
Price 10,000 rupiahs/ 100 gram (about USD 75 cent)						
4	Fair	50	2	5	3,80	0,833
5	More expensive among competitors	50	1	5	2,82	0,941
<b>Color</b>						
6	Bright Brown	50	2	5	3,68	0,868
7	Not burning	50	1	5	2,40	1,088
8	The color is Interesting	50	2	5	3,54	0,838
<b>Texture</b>						
9	Tin and Crunchy	50	2	5	3,88	0,824
10	Fit with respondent expectation	50	2	5	3,80	0,904
<b>Aroma</b>						
11	Sweet-scented	50	2	5	3,96	0,807
12	Arousing Intention to buy	50	2	5	3,86	0,783
<b>Chopping Shape</b>						
13	Oval (whole)	50	1	5	2,80	0,990
14	Irregular form of Chopping	50	1	5	3,50	0,953
15	Crushed	50	1	5	2,94	1,077



Table 3. The respondents' perception about Semaufried shallot

Description		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Taste</b>						
1	Savory	0 (0%)	1 (2%)	6 (12%)	30 (60%)	13 (26%)
2	Salty	1 (2%)	3 (6%)	9 (18%)	24 (28%)	13 (26%)
3	Fit with respondent taste	1 (2%)	3 (6%)	10 (20%)	25 (50%)	11 (22%)
Price 10,000 rupiahs/ 100 gram (about USD 75 cent)						
4	Fair	0 (0%)	5 (10%)	8 (16%)	29 (58%)	8 (16%)
5	More expensive among competitors	2 (4%)	19(38%)	17(34%)	10(20%)	2 (4%)
<b>Color</b>						
6	Bright Brown	0 (0%)	7(%)	8(%)	19(%)	6(%)
7	Not burning	8 (16%)	26 (52%)	7 (14%)	6 (12%)	3 (6%)
8	The color is Interesting	0 (0%)	4 (8%)	22 (44%)	17 (34%)	7 (14%)
<b>Texture</b>						
9	Thin and Crunchy	0 (0%)	4 (8%)	8 (16%)	28 (56%)	10 (20%)
10	Fit with respondent expectation	0 (0%)	5 (10%)	11 (22%)	23 (46%)	11 (22%)
<b>Aroma</b>						
11	Sweet-scented	0 (0%)	3 (6%)	8 (16%)	27 (54%)	12 (24%)
12	Arousing Intention to buy	0 (0%)	2 (4%)	13 (26%)	25 (50%)	10 (20%)
<b>Chopping Shape</b>						
13	Oval (whole)	1 (2%)	25 (50%)	9 (18%)	13 (26%)	2 (4%)
14	Irregular form of chopping	1 (2%)	8 (16%)	11 (22%)	25 (50%)	5 (10%)
15	Crushed	4 (8%)	16 (32%)	11 (22%)	17 (34%)	2 (4%)

Table 4. Additional Revenue for fried shallot production

Shallot			Fried shallot			incremental	
Shallot 2 kg	IDR	40,000	Shallot 2 kg	IDR	40,000	IDR	0
			Cost of production for 700 g		(27,055)		(27,055)
			Sales		70,000		70,000
	IDR	40,000		IDR	82,945	IDR	42,945

### Response to Editor Comments and Suggestions

Editor comments and suggestions	Response
General comments: The manuscript is written non-systematically and vaguely. Readers are likely to be confused with the main purpose of the research	Thank you for this constructive comment. The manuscript has been improved at all
The objective of the manuscript The purpose of the research stated is not clear and different from the research	Statement of the purpose of the research has been revised
You might be confused with the shallots and onions. Shallots and onions are different, although shallots come from the onion family. Overall manuscript gave an impression that the fried shallots were produced from onions. Please clarify in the manuscript.	Thank you for reading in details and this constructive comments. All authors have been discussed to clarify on this. It has been clarified and revised accordingly
Since the shallots used are from Semau Island, there is no need for the word 'Semau fried shallots' as there is no comparison in between products. Suggest to only use fried shallots throughout the manuscript.	It has been revised accordingly
Materials and methods - Please rearrange the sequence. Market research was conducted first. Not the production of fried shallots. No input/description of how the consumer survey in the market research was conducted. Please add in.	The sequence of primary and secondary research market has been rearranged
Results and discussion - Please remove the subtopic of fried shallot and incorporate it into the market research outcome. You can either place sub-sub topics in the market research outcomes such as primary research, fried shallot production, secondary research.	It has been revised

### Response of Editor comments and suggestion (in details of the manuscript)

Section	Editor comments and suggestions	Response
Title	Suggest to be change to: Market research and cost analysis of production of fried shallot as local superior product in Semau Island, East Nusa Tenggara, Indonesia	The title has been changed accordingly
Abstract	The purpose of the research is very vague. There is no development of fried shallot. In my opinion, the research is more of	It has been revised

	performing a market research and cost analysis of the fried shallots production.	
Introduction	<p>Please explain. Onions are different from shallots.</p> <p>Therefore, the objective of this research was to develop fried shallot and its feasibility analysis as an effort to improve farmer income.</p>	<p>It has been revised</p> <p>It has been revised</p>
Materials and methods	<p>Please provide the proper reference for AOAC methods used.</p>	<p>It has been provided with the proper reference for AOAC methods:</p> <p>AOAC, 2003. Official methods of analysis of the association of official's analytical chemists, 17th edn. Association of official analytical chemists. Arlington, Virginia.</p>
Table 4	Please clarify. Shallots or onions?	It has been revised

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FR-2019-250 revised Inbox x

Dr. Diyah Tulipa, SE., MM. <diyah@ukwms.ac.id>  
to Food

Dear Dr Vivian,  
  
Thank you for the quick response. We have been revised the article on name and affiliation that we highlighted. The revised article is attached.  
We will make a payment before 17 Oct 2019.  
Thank you.

Best regards,  
Dr. Diyah Tulipa  
Lecturer  
Widya Mandala Catholic University Surabaya  
Jalan Dincyo 42-44 Surabaya 60625  
Telp +62-31-5678478



Food Research <foodresearch.my@outlook.com>  
to me

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## Re: FR-2019-250 - Article Updated Inbox x

**Food Research** <foodresearch.my@outlook.com>  
to me

Wed, Oct 9, 2019, 8:08 PM

Dear Dr. Diyah,

Thank you for the payment.

Kindly be informed that your manuscript has been assigned to Food Research 2020, Vol. 4, Issue 2 (April). Your manuscript is currently available online and in press on our website <https://www.myfoodresearch.com>. Alternatively, you can download a copy of the manuscript by clicking on the following link: [https://doi.org/10.26656/fr.2017.4\(2\).250](https://doi.org/10.26656/fr.2017.4(2).250)

We encourage you to share your published work with your colleagues. Thank you for your fine contribution. We hope that you continue to submit other articles to the Journal.

Thanks & Regards,  
Dr. Vivian New  
Editor  
Food Research

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**From:** Dr. Diyah Tulipa, SE., MM. <[diyah@ukwms.ac.id](mailto:diyah@ukwms.ac.id)>  
**Sent:** Wednesday, 9 October, 2019 12:33 PM  
**To:** Food Research <[foodresearch.my@outlook.com](mailto:foodresearch.my@outlook.com)>  
**Subject:** Payment FR-2019-250

Dear Dr. Vivian,

25<sup>th</sup> August 2019

Dear Dr. Kuan,

**ACCEPTANCE LETTER**

Food Research, is pleased to inform you that the following manuscript has been accepted for publication in Food Research journal.

Manuscript Title : Development, market research and cost analysis of fried shallot as local superior product in Semaui Island, East Nusa Tenggara, Indonesia  
Authors : Diyah Tulipa, Dyna Rachmawati, Lenna Elitan and Ignatius Srianta

We thank you for your fine contribution to the Food Research journal and encourage you to submit other articles to the Journal.

Yours sincerely,



**Professor Dr. Son Radu**  
Chief Editor  
Food Research

