

## Consumer Preferences for Purple Yam (*Dioscorea alata* L.) Powder Brands: Implications for a Product Developed by the University of the Philippines Los Baños

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### Abstract

The study compares the attributes of three brands of purple yam (*Dioscorea alata* L.) powder, namely, Giron Powdered Purple Yam, FST Foods Purple Yam “Ubi” Powder, and Bohol’s Tru Ubi Powder, and the resulting *ubi halaya*, a local pudding made of purple yam, made from these brands. Store checks, focus group discussions (FGDs), product and home placement tests, and a consumer survey for the local market were used as data-gathering tools. Frequency counts, mean ratings, and standard deviation were used to analyze consumer awareness, consumption behavior, and product attribute importance ratings of respondents. Kruskal-Wallis test was also employed to find out if there were significant differences in the mean ratings for all attributes across brands. The results of the study show that consumers preferred the attributes of the FST Foods Purple Yam “Ubi” Powder and the *halaya* made using the brand. The product can thus be considered ready for commercialization by potential investors. However, it is recommended that a detailed set of product use instructions should be printed in its packaging to come up with *halaya* that has better taste, aroma, and consistency.

**Keywords:** consumer preferences; purple yam (*Dioscorea alata* L.); technology commercialization; *ubi halaya*

### Acronyms:

BAR – Bureau of Agricultural Research  
 BFWC – Bohol Federation of Women Cooperatives  
 CA – College of Agriculture  
 CEM – College of Economics and Management  
 CPAR – community-based participatory action research  
 FGDs – focus group discussions  
 IFST – Institute of Food Science and Technology  
 NSCB – National Statistics Coordinating Board  
 NTCP – National Technology Commercialization Program  
 UPLB – University of the Philippines Los Baños

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## Introduction

The greater or purple yam (*Dioscorea alata* L.) is a tuberous root crop with white to dark purple flesh. According to Alexandre and Coursey (1969; qtd. in Coursey, 1976), the cultivation of different species of *Dioscorea* started independently in Southeast Asia, West Africa, and pre-Columbian tropical America. In Asia, the origin of *D. alata* can be traced back to the area now found at present-day Burma and China where the rivers Irrawaddy, Salween, and Mekong ran in proximity to each other. Cultivation of the yam slowly spread to the Philippine archipelago and the islands of Oceania (Burkill, 1951; qtd. in Léon, 1976).

In the Philippines, purple yam, locally known as *ube* or *ubi*, is commercially grown (Salda et al., 2005), with annual local production reaching 26,464 metric tons from 2000–2005. Some of the popular purple yam varieties produced in the country are the following: Kimabajo and Sampero, which have light purple flesh; Rapang-rapang and Shiket, which have dark purple flesh; and Daking, which has white flesh and purple peel (Cornago et al., 2011). In provinces of the country, purple yam is consumed boiled and as an ingredient in local dishes and sweets. Today, this root crop is also gaining popularity as flavoring and ingredient to a wide array of food products, such as ice cream, dried chips/flakes and peels, puree, yam paste, jam preserve, candies, breads, and cookies, just to name a few (Salda et al., 2005).

One native delicacy, a Filipino dessert, that uses purple yam as its primary ingredient is *ubi halaya* or yam pudding. The word *halaya* was derived from the Spanish *jalea*, which means “jelly.” Traditionally, purple yam is harvested in November until late January. Hence, many Filipinos associate the flavor of *halaya* with the arrival of the holidays as it is usually consumed during *nochebuena* (Christmas Eve dinner) or *medianoche* (New Year’s Eve dinner). But nowadays, *halaya* is usually present during special occasions any time of the year.

To make *halaya*, purple yam is boiled, grated, mixed with milk and sugar, and then cooked. The strenuous and long process involved in cooking this delicacy makes it labor intensive, taking a number of hours to prepare one batch of *halaya* (Marasigan, 2005) (Appendix 1).

Given this situation, using purple yam powder, which will substantially cut the processing time of *halaya*, is an attractive option, especially for those who are working (Appendix 2). Furthermore, the processing of purple yam into powder can be a value-adding business that can satisfy the demand in the local and international markets for a readily available, convenient-to-use raw material for the preparation of the delicacy.

As the research is a combination of a product development and a test marketing type of market research (Zikmund and Babin, 2010), it aims to determine the overall acceptability of local brands of purple yam powder, identify areas for product improvement, and provide strategies for the positioning and introduction of such a product in the market. The specific research questions are the following:

1. What are the attributes of purple yam powder and *halaya* that consumers consider important?
2. Are there differences in consumers' perceptions of how currently available brands satisfy these important product attributes?
3. Which brand does the respondents prefer and why?
4. What are the implications of the study's results to the improvement and introduction of such a product in the market?

## Materials and Methods

### Data Collection

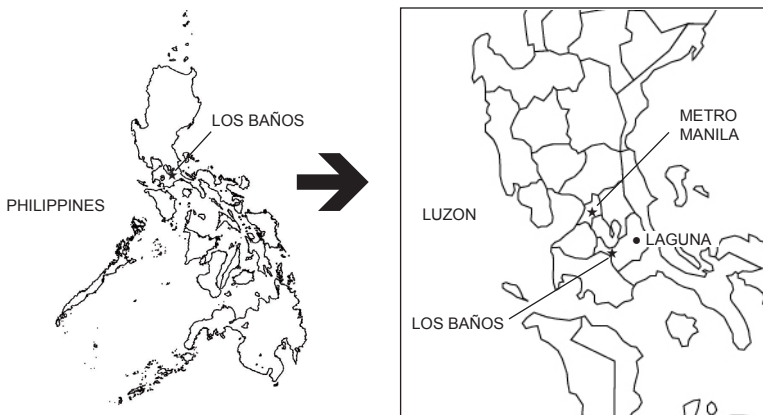
A consumer survey was conducted to gather information regarding consumer awareness, behavior, and preference for attributes of the purple yam powder brands available in the market. A product test of three purple yam powder brands and their respective *halaya* samples were also conducted. Store checks, focus group discussions (FGDs), and a home placement test were conducted for supplementary data gathering.

*Store checks.* The outlets initially included for the store checks were the major retail outlets in Los Baños—namely, Robinsons Supermarket, South Supermarket, and Walter Mart in Olivarez Los Baños branch—as well two public markets in the town. Since these outlets did not carry purple yam powder, SM branches in the nearby cities of Manila and Sta. Rosa—i.e., SM Sta. Rosa, SM Makati, and SM Megamall—were visited to conduct store checks.

*Focus group discussions.* Four FGDs were conducted with six participants each. The two FGDs were attended by working<sup>1</sup> female spouses while the other two were attended by nonworking female spouses as respondents. The researchers designed the FGDs this way to validate whether working female spouses were more inclined to appreciate the attributes of purple yam powder and, thus, purchase the product. All respondents were residents of Los Baños, Laguna, Philippines (Figure 1).

*Consumer survey.* The survey was conducted to gather information regarding consumer awareness, behavior, and consumer preference for attributes of the purple yam powder brands. It included a product test of the identified purple yam powder brands and their respective *halaya* samples. One hundred respondents were included for this study. This number is referred to as the “favorite sample size in the (Philippine market research) industry” (Roberto, 1996), which satisfies the following conditions: (1) maximum data variability of 0.25 [= 0.50 (1.00 – 0.50)]; (2) an acceptable 95% confidence level; and (3) an acceptable  $\pm 10\%$  error margin. The respondents were chosen through a combination of purposive and quota sampling to meet the study objectives. The criteria used in choosing the respondents were the following: (1) a female spouse, either working or nonworking; (2) a resident of Los Baños; and (3) someone who was familiar with *halaya*. As for the quota sampling, 50 working and 50 nonworking respondents were targeted. Data collection was done by going to schools and administering the survey among respondents waiting to pick up their children.

*Home placement test.* Six female spouses, half of which are working and the other half nonworking, were selected randomly from the FGD participants to



**Figure 1.** Map showing the location of Los Baños, Laguna, Philippines

take part in the home placement test of the three purple yam powder brands. The respondents were asked to evaluate the ease of preparation, clarity of instruction, and the rate of recovery of each brand. The samples given were good for only one preparation, and the participants were given a month to try all the three brands.

### Data Analysis

In analyzing the survey results, frequency counts and mean ratings were used to analyze consumer awareness, consumption behavior, product attribute importance ratings, and brand ratings of respondents. The standard deviations of the ratings per attribute were also derived to validate the importance rankings (based on the mean ratings) of the attributes. Kruskal-Wallis test, on the other hand, was used to find out if there were significant differences in the mean brand ratings for all attributes.

## Results and Discussion

### Purple Yam Powder Brands

*Giron Powdered Purple Yam.* Giron Powdered Purple Yam is produced by Giron Foods Inc., which is based in Silang, Cavite. The company's other products include powdered cassava, sweet potato, banana, taro, and squash, as well as purple yam puree/extract, tamarind concentrate, and preserved tropical fruits and vegetables (AFMIS, 2011).

The 'Tagalog' purple yam variety is used by the Giron brand in producing the powder as this variety is the most commonly cultivated in Southern Luzon. This variety has a deep purple color, has a strong aroma when cooked, and is considered a more suitable raw material for the production of purple yam powder since it has a higher recovery in terms of the conversion of raw material to powder (Hernandez and de Villa, 2008).

Giron Powdered Purple Yam is available in 120-g and 500-g packs, sold at Php 64.75 and Php 214.00, respectively. Giron's packaging is composed of polyethylene bags placed inside carton boxes (Figure 2a).

*Bohol's Tru Ubi Powder.* Bohol, one of the islands in the Visayas, is known as the purple yam capital of the Philippines. It is particularly known for its 'Kinampay,' which Boholanos believe is the best-tasting purple yam variety. The variety is more aromatic and has a deep purple color (Hernandez and de Villa, 2008). Not only is purple yam a cash crop in Bohol, it is also considered sacred. Legend has it that during a famine, only purple yam grew in the soil, and it helped the Boholanos survive (Cruz, 2008).



**Figure 2.** Different brands of purple yam powder used in the study: (a) Giron Powdered Purple Yam; (b) Bohol's Tru Ubi Powder; and (c) FST Foods Purple Yam "Ubi" Powder.



Bohol's Tru Ubi Powder sources its 'Kinampay' from local farmers trained in organic production. The product is owned and managed by Mayacabac Ubi Growers and Processors Producers Cooperative and processed in its Mayacabac purple yam powder processing plant in Dauis, Bohol. The Bohol Federation of Women Cooperatives (BFWC) takes care of the marketing of the powder (Cruz, 2008). There are several entities who ventured into purple yam powder production in Bohol. The commercialization of the technology took off from the community-based participatory action research (CPAR) project on "Ubi Agribusiness Development" supported by the Bureau of Agricultural Research (BAR).

Currently, Bohol's Tru Ubi Powder is only available in Bohol. It was, however, suggested that the brand be included in the consumer preference study because it was already commercialized and was likely to enter the Southern Tagalog market soon, which makes it a potential competitor.

Bohol's Tru Ubi Powder is offered in 250-g packs sold for PhP 95.00. The product is packaged in polyethylene bag as the main container of the powder and placed inside a carton box (Figure 3b).

*FST Foods Purple Yam "Ubi" Powder.* In 1989, the Institute of Food Science and Technology (IFST)<sup>2</sup> at the University of the Philippines Los Baños (UPLB) developed the FST Foods Purple Yam "Ubi" Powder. The initial formulation of the product included powdered milk and sugar as ingredients of the instant *halaya*. In 2003, the institute started selling to walk-in customers 100% pure purple yam powder made from all natural tubers of the 'Tagalog' variety. As a promotional initiative, the institute participated in several agri-fairs where the product was showcased and sold and published write-ups to generate publicity for the product. When many people started to patronize the product, it became an income-generating product for the IFST.

BAR, under its National Technology Commercialization Program (NTCP), supported the project entitled "Technology Commercialization and Packaging Development of Ubi Powder" to package the technology for commercialization to meet new local and international requirements on packaging and labeling. Exploratory market research on the product revealed that its packaging needed further improvement and the market introduction of the product requires an increase in production, which necessitates the establishment of a purple yam processing plant (Fernandez, 2009). Initial computations show that the technology can generate 58.13% net income after deducting the operating costs and a return on investments of 143% can be realized from this venture (Hernandez and de Villa, 2008).

At present, the product has not been commercialized and is only available at IFST and a one-stop shop in UPLB. IFST is looking for prospective investors for the technology transfer and commercialization of the purple yam powder.

FST Foods Purple Yam "Ubi" Powder is offered in 100-g packs sold for PhP 50.00. The product is packaged in polyethylene bag as the main container of the powder and placed inside a carton box (Figure 3c).

### **Respondents of the Focus Group Discussions**

Four FGDs were conducted with six participants each; working female spouses participated in two FGDs and the nonworking female spouses participated in the other two. The first group of working respondents was composed of faculty and staff of the College of Economics and Management (CEM) of UPLB, and the session was held inside the university campus. The other group of working respondents and the two groups of nonworking respondents were composed of female residents of Los Baños. These FGDs were held at the Batong Malake Rural Health Unit.



All the participants were consumers of *halaya*, and the common place of consumption was their own home, residence of their acquaintances, restaurants, and places where the delicacy is a specialty (e.g., Tagaytay and Baguio).

Among the working respondents, five out of the 12 participants were aware that purple yam powder was available in the market. None of the nonworking respondents, on the other hand, were aware of such product. The brand that the working respondents were familiar with was the FST Foods Purple Yam “Ubi” Powder since it was readily available and accessible in their area. They learned about it through word of mouth. According to those who had tried the product (using the previous formulation of FST Foods), the *halaya* they came up with did not look and taste like traditionally produced *halaya*. The texture of the final product was assessed as unacceptable. Despite unsatisfactory results from previous trials of the purple yam powder, the FGD participants were still willing to try any brand because of the ease of preparation and the significant reduction in cooking time that using the product affords them.

### Purple Yam Powder Attributes

*Product attribute analysis.* The consumer survey results showed that among the purple yam powder attributes rated by the respondents in terms of importance, texture ranked highest, followed by general appearance, color, price, aroma, clarity of instruction, packaging, and brand name. The standard deviations for each attribute ranged from .5664 to .9837, which are relatively small and suggest that the ratings of all respondents are more or less clustered (Table 1).

**Table 1.** Mean ratings of purple yam powder attributes

Attribute	Mean rating	Standard deviation
Texture	1.27	0.6942
General appearance	1.28	0.6526
Color	1.30	0.6276
Price	1.32	0.5664
Aroma	1.46	0.7577
Product usage instruction	1.47	0.6269
Packaging	1.58	0.5891
Brand name	2.11	0.9837

**Note:** 1 – Very important; 2 – Important; 3 – Neither important nor unimportant; 4 – Unimportant; 5 – Very unimportant



Texture was already pre-identified as early as the FGDs as the most important attribute as consumers tend to associate the coarse texture of purple yam powder with the presence of extenders. Thus, a fine texture connotes pureness and quality of the product. The same explanation goes for the second- and third-most important attributes, general appearance and color. During the FGDs, whenever a participant would notice that a powder brand was of a different color, they would inquire whether there was another ingredient mixed with the powder.

With regards to brand name, it is interesting to note that among the 18 people (out of 100) who made their own *halaya*, only 3 of them had tried using purple yam powder, in particular the FST Foods brand. The respondents did not know that powdered purple yam was available in the market and were not familiar with the other existing brands.

*Product test.* The second part of the consumer survey was a product test, which was conducted to assess the consumers’ preference for the purple yam powder brands based on attributes like color, aroma, taste, and texture. The analysis was conducted for each group of respondents, the working and nonworking (Table 2).

For the nonworking respondents, the highest ratings for all the attributes of purple yam powder were posted by FST Foods brand. Vis-à-vis the two other brands, the ratings for the FST Foods brand posted a big difference in terms of texture. Giron and Bohol’s brands, on the other hand, posted not-so-distant mean ratings in terms of color, aroma, and texture. The two brands were also ranked lowest for general appearance and aroma, respectively.

To test if significant differences existed in the mean ratings across brands, the Kruskal-Wallis test was conducted. Results show that all of the differences

**Table 2.** Mean ratings and Kruskal-Wallis test results for the attributes of the three purple yam powder brands by working and nonworking female respondents

Attribute	Nonworking				Working			
	Giron	FST Foods	Bohol’s		Giron	FST Foods	Bohol’s	
Color	2.56	1.52	2.88	***	2.12	1.50	3.48	***
Texture	2.84	1.50	2.86	***	3.00	1.28	3.10	***
Aroma	2.86	1.92	3.04	***	2.10	1.96	3.28	***
General appearance	3.04	1.98	2.36	***	2.62	1.30	2.98	***

**Note:** 1 – Extremely like; 2 – Like; 3 – Slightly like; 4 – Neither like nor dislike; 5 – Slightly dislike; 6 – Dislike; 7 – Extremely dislike  
\*\*\* Significant at 1%

in mean ratings across brands were highly significant. Therefore, preferential differences exist for all attributes of the three brands of purple yam powder for the nonworking respondents, with the attributes of the FST Foods Purple Yam “Ubi” Powder being preferable than the other brands.

For the working respondents, FST Foods brand ranked the highest in all attributes, namely, color, texture, aroma, and general appearance. The brand was rated highly in terms of texture vis-à-vis the Giron and Bohol’s brands. During the FGD, the respondents liked the texture of the FST Foods brand as it was very fine, which implied the absence of extenders.

However, though FST Foods rated the highest across attributes, the difference in ratings in terms of aroma between FST Foods and Giron brands was small. Giron got the second-highest mean ratings for all the attributes while Bohol’s showed the lowest. Bohol’s, in particular, rated the lowest in the attribute of color. In terms of texture and general appearance, Giron and Bohol’s brands were almost at par with each other.

Results of the Kruskal-Wallis test for the ratings of the working respondents show that significant differences exist in the mean ratings of the attributes across the three brands of purple yam powder, with the FST Foods brand exhibiting superior attributes over the other two.

### ***Ubi Halaya Attributes***

*Product attribute analysis.* Among the attributes of *halaya*, taste was considered the most important, followed by texture, color, aroma, and volume of the final product. The standard deviations of each attribute are relatively small, ranging from 0.4422 to 1.0384, which implies that the ranks based on the mean ratings of each attribute are valid (Table 3).

Taste is usually the most important attribute for end-products, which are subjected to a product test. From the FGDs, it was discovered that respondents expect the taste of *halaya* produced using the powder to be the same as that of *halaya* produced using the traditional process. The participants preferred *halaya* that has a smooth texture and has the natural color of purple yam.

*Product test.* Results reveal that in contrast to the product test for the powder brands, the ratings by nonworking respondents for *halaya* made from Giron brand and that from FST Foods brand were not that different from each other, especially in terms of taste. Giron brand posted the highest rating in terms of aroma. However, the highest average ratings for the other attributes were still posted by *halaya* made from FST Foods Purple Yam “Ubi” Powder (Table 4).

On the other hand, *halaya* made from Bohol’s brand ranked consistently low across all attributes. The Kruskal-Wallis test reveals that there were

**Table 3.** Mean ratings of *ubi halaya* attributes

Attribute	Mean rating	Standard deviation
Taste	1.08	0.4422
Texture	1.25	0.6700
Color	1.34	0.6093
Aroma	1.42	0.6694
Volume of the final product	1.95	1.0384

**Note:** 1 – Very important; 2 – Important; 3 – Neither important nor unimportant; 4 – Unimportant; 5 – Very unimportant

**Table 4.** Mean ratings and Kruskal-Wallis test results for the attributes of *ubi halaya* made from three purple yam powder brands for the nonworking and working respondents

Attribute	Nonworking				Working			
	Giron	FST Foods	Bohol's		Giron	FST Foods	Bohol's	
Taste	1.70	1.68	4.38	***	1.48	1.36	4.18	***
Color	2.10	1.64	3.70	***	2.26	1.32	4.08	***
Texture	2.20	1.72	4.26	***	2.22	1.48	4.16	***
Aroma	1.86	2.14	3.68	***	1.50	1.80	3.56	***
General appearance	1.98	1.78	3.88	***	2.06	1.32	3.76	***

**Note:** 1–Extremely like; 2–Like; 3–Slightly like; 4–Neither like nor dislike; 5–Slightly dislike; 6–Dislike; 7–Extremely dislike

\*\*\* Significant at 1%

significant differences in the mean ratings per attribute across the three brands. *Halaya* made from FST Foods was perceived superior by the nonworking respondents in all attributes, except aroma.

In contrast to the results from the nonworking respondents, the differences in ratings by the working respondents of the attributes of *halaya* across the three brands were more evident. Ratings for *halaya* made from FST Foods brand did not exceed 2, suggesting that attributes for the product are well liked by the working respondents. However, though the differences between the ratings were larger, the pattern in the results was almost the same as that of the nonworking respondents. FST Foods posted the highest average rating in all of the attributes, except in terms of aroma. Giron brand got a higher rating in aroma. But on the other hand, Bohol's brand consistently ranked

low across all the *halaya* attributes, even posting a rating of 4.08 (neither like nor dislike) in terms of color.

The Kruskal-Wallis test results indicate that significant differences exist among the mean ratings of working respondents for each attribute across the three brands. This group also rated *halaya* made from FST Foods brand superior in all attributes, except aroma.

The comments made during FGD sessions validate the results of the product test. The participants expressed the most liking for *halaya* made from FST Foods, and it was found superior in terms of taste, color, texture, consistency, and aroma. They did not like the taste of *halaya* made from the other two brands because one was too sweet while the other tasted more like bread. The ones made from FST Foods brand was assessed to have a smooth texture, with those from the other two brands found to be gritty. However, the aroma of *halaya* made from FST Foods and Giron brands were perceived to smell more like milk rather than natural purple yam. As for consistency, the moderately thick consistency of *halaya* made from FST Foods brand was much appreciated by the respondents.

*Home placement test.* Results reveal that *halaya* made from Bohol's Tru Ubi Powder was the easiest to prepare, followed by FST Foods and Giron, respectively. However, despite giving Bohol's brand high ratings in ease of preparation, earlier participants in the FGD did not like attributes of the resulting *halaya*. In terms of recovery (i.e., the final volume of *halaya* compared to the amount of purple yam powder and other ingredients used), those made from FST Foods brand were found to be the most acceptable. Lastly, the clarity of the instructions for the three brands of purple yam powder was found just acceptable, which suggests that there is still room for further improvement in this aspect (Table 5).

**Table 5.** Summary of the home placement test participants' degree of acceptability of the preparation attributes of three purple yam powder brands

Attribute	Giron	FST Foods	Bohol's
Ease of preparation	Fairly acceptable	Acceptable	Very acceptable
Clarity of instruction	Acceptable	Acceptable	Acceptable
Recovery	Acceptable	Very acceptable	Fairly acceptable

**Note:** 1–Very acceptable; 2–Acceptable; 3–Fairly acceptable ; 4–Not acceptable

## Summary, Conclusions, and Recommendations

The FST Foods Purple Yam “Ubi” Powder was consistently the most preferred brand of purple yam powder, both by working and nonworking respondents. The respondents also found the *halaya* made from FST Foods superior in almost all attributes. The only area for improvement for the FST Foods brand is the aroma of the produced *halaya*.

The other two brands, Giron Powdered Purple Yam and Bohol’s Tru Ubi Powder, should take note of the preferences of consumers reflected in the results of the study in order to further improve their products.

As for the FST Foods brand, the focus should not be on improving the powder itself, but on modifying how the *halaya* recipe is prepared using the powder. Adding vanilla extract in the recipe is an option to improve the aroma of the resulting *halaya*. If this recommendation is found sound after conducting additional market tests, then this should be included in the product usage instruction. In addition, the instructions should be more detailed (e.g., emphasis in the use of a nonstick pan in preparing *halaya* for optimal results) and further simplified to increase its comprehensibility for consumers.

According to the FGDs, the main factor that influenced the purchase decision of the nonworking respondents was price, and for the working respondents, convenience. These are considerations worth noting in the positioning of the FST Foods brand. As results of the brand ratings across all powder and *ubi halaya* attributes, except for aroma of the powder, suggest that the working group preferred the FST Foods brand more than the nonworking group, marketing efforts should be directed to the former group. It is most probable that the working female spouses will have the higher propensity to buy the powder. They have the buying capacity and can be motivated to buy due to the convenience it can afford them. In the long run, local institutional buyers and the international market can be tapped.

The product introduction strategies for FST Foods Purple Yam “Ubi” Powder should center on developing visibility, increasing market share, and creating brand equity. FST Foods needs to be made more available and visible in the market by utilizing various distribution channels (i.e., supermarkets, groceries, *pasalubong* centers, *sari-sari* stores, etc.), engaging in promotional activities such as free product taste tests in supermarkets using the product, and direct-selling the product. To address the information gap about the existence of purple yam powder, e-marketing and marketing in social networks may be an effective strategy.

The high ratings given by respondents on the attributes of the FST Foods product suggest that it is ready for commercialization by potential investors. It is imperative that the product should be made visible in investors’ fora and trade fairs and exhibits, as well as online, to reach possible investors and

buyers. After an investor is identified, the formal licensing agreement can then be formulated, which will contain the details of the technology transfer arrangement between UPLB and the investor.

## Notes

1. In differentiating between “working” and “nonworking” female spouses, we adopt the operational definition of “work” formulated by the National Statistics Office (NSCB, 2011):

Any activity that a person does during the reference period, for pay in cash or in kind, in any establishment, office, farm, private home, or for profit or without pay on a family farm or enterprise. It also includes a) what a farm operator or member of the operator’s family does on the farm operated by another household on exchange labor arrangement; and b) any activity that a person does in relation to minor activities in home gardening, raising of crops, fruits, hogs, poultry, etc., fishing for home consumption and manufacturing for own use. However, there must be some harvest in the case of home gardening, raising of crops, fruits and nuts, and gathering of wild fruits and vegetables; animals disposed of (sold, consumed, bartered, or given away), or some catch in fishing in order that these activities will be considered work.

2. The Institute for Food Science and Technology (IFST) is now known as the Food Science Cluster under the College of Agriculture in UPLB.

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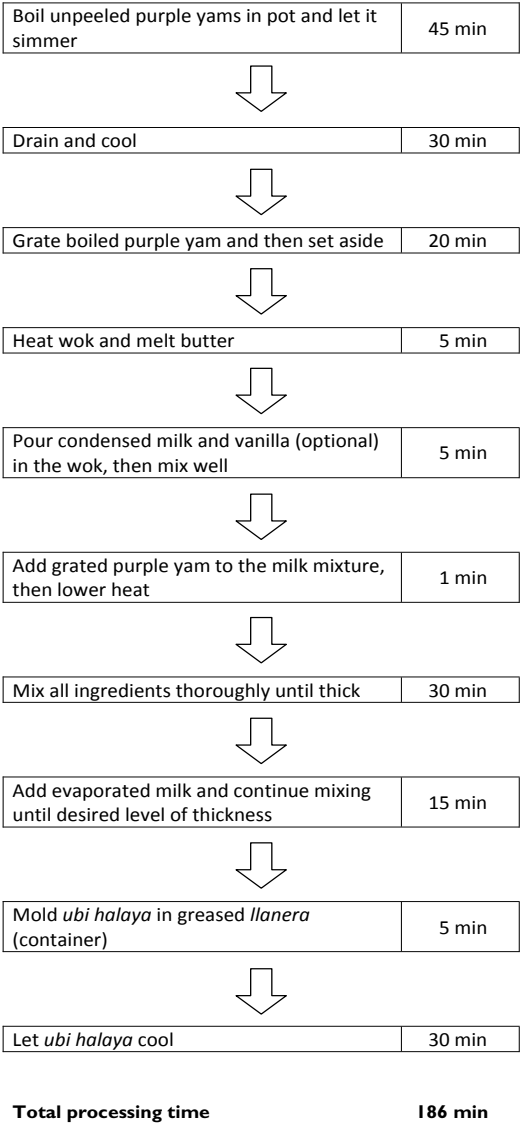
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**Appendix 1:** Traditional process of preparing 250-g *llanera* (container) of *halaya*, with approximate preparation time



**Appendix 2:** Modern process of preparing 250-g *llanera* (container) of *halaya* using *ubi* powder, with approximate preparation time

