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DEVELOPMENT AND EVALUATION OF RIMAS (ATOCARPUS ALTILIS PARK FOSBERG) CATSUP

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ABSTRACT

The study was conducted to utilize rimas (artocarpusaltilis park fosberg) for catsup production. The study aimed to evaluate whether rimas catsup possessed desirable characteristics in terms of physical qualities, proximate composition, sensory qualities, consumer acceptability and cost production.Different levels of rimas namely 0, 25, 50, 75, 100% were used to substitute banana in the production of rimas catsup. Qualities of rimas catsup were evaluated using the standard methods set by AOAC (1980).Rimas catsup got a pH of 3.88, TTA of 0.76%, TTS of 22.0'. Brix with a viscous consistency and a very fine and smooth textural quality. Proximate composition of rimas catsup is much better than its counterpart, although T0 got higher dry matter, ash, crude fiber content, however T4 got higher crude protein and moisture content of 0.84 and 74.54% respectively. Results indicated that out of 100 respondents only 39% signified they liked the newly developed rimas catsup and 15% disliked the product. For commercial catsup obtained the highest acceptability score with 41% respondents signified they liked the commercial product. While there were 5% disliked the commercial catsup. Catsup using 100% rimas in the formulation got the highest recovery yield of 69%, lowest production cost at P75.80 and highest gross income and net profit of P222.00 and 143.40 respectively. Therefore, processing rimas catsup is technologically possible and economically feasible.

KEYWORDS: development, production, evaluation, rimas catsup.

INTRODUCTION

Malnutrition is one of the problems in the country today. Vitamin A deficiency, protein and calorie malnutrition (PCM) are among of the predominant in the country. The common victims of which are preschoolers, school children, pregnant as well as lactating mothers. Majority of the victims were from rural areas and urban poor (FNRI, 1997). Malnutrition is a complex problem interwoven with several factors. Among the causes of malnutrition are poverty, ignorance and lack of knowledge in the utilization of vitamin-rich indigenous food materials like fruits and vegetables. On the other hand, Philippines is blessed with different kinds of indigenous fruit crop grown throughout the country. In Region VIII alone, a number of indigenous fruit crops are considered unexploited and unexplored. Rimas is one of the indigenous fruit crop abundant in the locality particularly in the coastal areas.

As quoted by Coronel (1983), rimas is considered a staple food in other countries, particularly in the Pacific archipelago because if prepared properly they make a good substitute for bread. In the country, it is among the most neglected fruits. They are grown mainly in the backyard and while no statistics on the number of trees grown in the country is available, it is certain that there are many of them existing. The reasons for scarcity are the ignorance of the nutritional value of the fruits; the absence of an easy and rapid method of propagating them and lack of processing for the utilization of the fruit. Coronel (1983) further contended that rimas is potential raw material for the production of novel food products considering the fact that the fruit contain fair amount of nutrient needed by the body. One hundred gram edible portion of rimas can provide 2.24 crude protein, 1.43 ash, 0.87 crude fat. It is rich in carbohydrates and calcium, a good source of Vitamin A and B but a poor source of Vitamin C. The fruit contain organic acid like citric, malic, oxalic, acetic, and folic acid.

Nevertheless, Lauzon (2000) emphasized that rimas bears fruit all year round and in most cases the fruits are just wasted. Rimas possesses a great potential for processing because of its unique physico-chemical properties and starchy nature. It is therefore possible to utilize rimas for catsup production. Catsup is one of the processed foods commonly used as accompaniment and flavor enhancer. It is well-liked by people of all ages most specially the children because of its sweet and sour taste. Almost all households use catsup in most food preparation. Utilizing rimas in the development of catsup not only diversify and maximize its usage but somehow minimized if not totally solve the problem of malnutrition in the country.

Catsup is a popular source used throughout the world. It is an acid food, which is commonly used as seasoning to viscous consistency. In addition, catsup was originally produced in China using fish as the main ingredient. Innovations were made until such time when tomatoes became the most popular raw material followed by banana. At present, the leading brand of catsup namely UFC and Del Monte uses both tomatoes and banana as basic ingredients for catsup formulation. Tomato is an excellent material for catsup production. But the highest, the seasonality and limited ecological adaptability of the crop is one of the factors that contribute to the relatively high cost of pure tomato catsup compared to its counterpart. However, banana is one of the alternative materials for catsup making, specifically that it is use as staple food. In some parts of the country, great volume is processed into fried chips and flour. Therefore, only certain percent of the banana produced is utilized for catsup production.

Furthermore, Amestoso (1995) claims that the demand for catsup is considerably high but there is a death of knowledge on the utilization of rimas for the development of catsup. Hence, there is a need for existing and prospective processors to search for readily available substitute raw materials to assure continuous processing of the product and to lower the cost of producing it, if possible without changing its sensory qualities.

In continuance therefore of the commitment to further develop rimas catsup and the lack of processing for the production of ready to use delicious and quality catsup as flavor enhancer in every food preparation. This prompted the researcher to undertake this research to open and venture new door of opportunities for those who may wish to engage in the production of rimas catsup. Finally, results of this study provides also a promising opportunity for Filipinosto plant and raise potential commercial crops like rimas thus stimulating agricultural development in the countryside.

MATERIALS AND METHODS

Procurement of Materials

Rimas fruit locally known as kulo, was secured from Naval Institute of Technology (NIT). Other materials like sugar, vinegar, pepper, cinnamon powder, salt, garlic powder, fresh onion, and food color were procured from Naval market and some ingredients were purchased at VSU market, Babay, Leyte.

Product Formulation / Procedure

Fresh and mature rimas were used in this study and time between harvest and processing was minimized to prevent harvest biochemical changes in the fruit that could possibly affect the product quality.

The fruits were freshly harvested and thoroughly washed, sliced, cored removed and steam-cooked for 25 minutes after which the cooked rimas was removed from the steamer, placed on a clear container and allowed to cool. Careful weighing of the needed ingredients thru homogenized mixture was transferred into a clear sauce pot and cooked at 85˚ C with constant stirring to prevent from scorching until total soluble solids (TSS) of 22 ˚ . Brix was hot fixed into a catsup bottle, particularly sealed, exhausted for 10-15 minutes, finally sealed, allowed to cool kept at temperature ready for evaluation. See Figure 1 (Process Flow of Catsup Production)

The experimental method of research was used in conducting the study employing the laboratory techniques and procedures. The data gathered was obtained for the result of the cooking made with several replications. Analysis on cost based on the actual prices of commodities during the time when the study was conducted and was computed accordingly. Physical qualities and proximate composition were analyzed in the laboratory using the specific equipment and following the standard procedures which was conducted at the Food Science section of Department of Agriculture Chemistry and Food Science, VISCA Baybay, Leyte. Sensory evaluation was made employing panel of

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tasters who scrutinized the sensory qualities of the product. Scores were computed into the weighted means subjected to statistical analysis to determine the treatment effects.

The analysis was done using the Randomized Complete Block Design (RCBD) and analyzed futher by Ducanan Multiple Range Test (DMRT) with the following treatments: T_0-100: 0 banana: rimas ratio; T_1 – 75:25 banana: rimas ratio; T_2 – 50:50 banana: rimas ratio; T_3 – 25-75 banana: rimas ration; T_4 – 0:100 banana:rimas ratio can produce better, quality and acceptable rimas catsup.

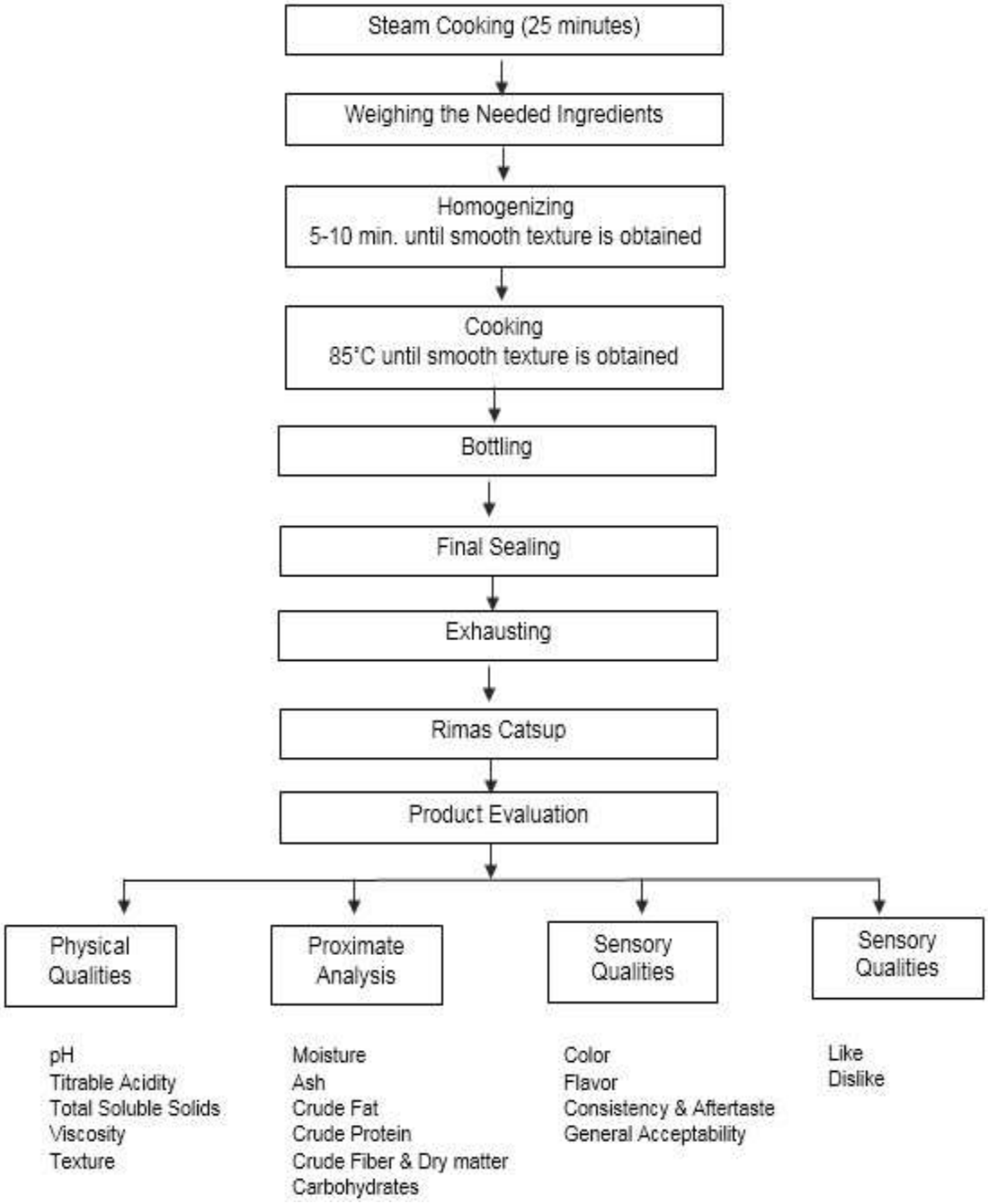

Figure 1. Flow Chart in the Production of Rimas Catsup

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RESULTS AND DISCUSSION

Product Evaluation

This segment presents the physical qualities of the rimas catsup. It includes the acidity (ph), titrable acidity (TTA) total soluble solid (TSS), viscosity and textures. Data are presented in Table 1.

The physical qualities of rimas are influenced by the level of catsup in the formulation. The higher the level of rimasin the formulation, the pH of the product moves toward acidic level but not significantly different with the control (T_0). As gleaned, T_4 and T_3 got the same pH value of 3.88 which is considered "acidic". However, the presence of ascorbic acid inrimas is advantageous as far as production of catsup is concerned for implies that incorporation of vinegar into the formulation can be minimized thus production cost can be reduced.

As depicted in the same table, the same trend of result was observed from titrable acidity (TTA) where in the higher the rimas level of formulation the greater titrable acidity was noted. However, total soluble solid (TTS) reduces levels of rimas in the formulation increases. Levels of rimas in the formulation does not affect the viscosity of the product. But the texture is fine and smooth with100% rimas has a very unique starch quality which is potential for rimas catsup production.

In terms of sensory attributes as shown in Table 3, the color, flavor, consistency, after taste and general acceptability of the newly processed rimas catsup (T_4 – 100% rimas) as evaluated by the panelists got the highest mean sensory rating compared to the difficult treatments. Rimas catsup got a better color compared to the control (T_0), but no significant differences were noted in terms of flavor, consistency, and aftertaste. But in terms of general acceptability 100% rimas (T_4) got significantly higher acceptability score compared to 100% banana or control (T_0) but not significantly different from treatments in the formulation. Looking at the results from sensory evaluation would imply that T_4 is considered the best formulation. The findings also disclosed that T_4 (100% rimas) had the best color comparable to control (T_0 – 100% banana).

Table 4 summarized the percent recovery of catsup as influenced by the amount of rimas in the formulation (T_4), 100% rimas catsup had the highest recovery yield of 69% which is significantly higher than the control (T_0 – 100% banana) where percent recovery of only 61.03%. The higher percent recovery in control (T_0 – 100% banana) can be attributed to the fact that matured rimas was very light and has meaty mixture. Thus a kilogram of rimas had a greater volume compared to a kilo of banana pulp. Findings, would denote that using rimas as raw material for catsup production pave a higher production yield that make the process profitable.

The consumers' acceptability ofrimas catsup is disclosed in Table 5. It could be observed based on the results that out of 100 consumers only 39% liked the newly developed rimas catsup and 15% of the consumers disliked the product. As disclosed in the results in the same table, 41% of the consumers scored they liked the commercial catsup. While only 5% disliked the said catsup.

Taking into consideration that the results of consumers' acceptability evaluation implied that more consumers preferred the commercial catsup. As far as consumer acceptance is concerned, rimas catsup is highly acceptable.

Table 6 contains the ingredients used in making rimas catsup which covered their price, volume, and unit price. Prices of all ingredients used were based on local retail price of the commodity. All the calculations in determining the production cost for each treatment is based on 1 kilogram volume of rimas in the formulation.

A glance at the figure in Table 7, it could be depicted that the cost of production is relatively cheaper/lower for (T_4) rimas catsup to the control (T_0). For every 250 ml of rimas catsup the cost is only P18.95 very much lower compared to the same volume of banana catsup which is P22.95 which gave the idea that the newly developed catsup had the lowest total production cost. The result implies that the cost of rimas catsup was less expensive compared to control (T_0).Findings in cost and return analysis disclosed that incorporation of rimas in catsup formulation lowers the cost of production, this resulted in relatively cheaper product thus increasing the process profitable.

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Table 1 Physical Qualities of Catsup as Affected by the Levels of Rimas in the Formulation

Treatment	pH	TTA (%)	TSS (°B)	Viscosity	Texture
T_o	4.02	0.76	31.0	Very Viscous	Rough
T_1	3.96	0.76	29.5	Very Viscous	Slightly rough
T_2	3.89	0.86	28.5	Very Viscous	Smooth
T_3	3.88	0.84	25.0	Viscous	Fine & smooth
T_4	3.88	0.76	22.0	Viscous	Very Fine & smooth

Table 2 Proximate Composition of Catsup as Affected by the Levels of Rimas in the Formulation

Proximate Composition

Sample	Moisture Content	Dry Matter	Ash	Crude Protein	EE (ether extract)	Crude Fiber
T_o- 100:0 – Banana:rimas	67.26	32.74	5.38	0.61	2.04	1.10
T_1 - 75:25 – Banana:rimas	73.03	26.97	3.31	0.46	1.61	0.07
T_2- 50:50 – Banana:rimas	73.99	26.01	5.13	0.41	1.62	0.09
T_3- 25:75 – Banana:rimas	73.67	26.33	3.88	0.76	1.39	0.12
T_4 - 0:100 – Banana:rimas	74.54	25.46	2.93	0.84	1.28	0.09

In terms of proximate composition it could be gleaned in Table 2 that rimas catsup got the higher moisture content compared to the control (T_0) but lower amount of dry water and ash. For crude fiber, 100% rimas got a lower of crude fiber compared to the control (T_0). While crude fat value was very lower than the control (T_0). Crude fat value was lower than the control (T_0) and the other treatment containing banana.

Table 3 Mean[1]Sensory Scores[2]of Rimas Catsup Formulation

SENSORY ATTRIBUTES

Treatment	Color	Flavor	Consistency	Aftertaste	General Acceptability
T_o	2.79 $_{bc}$	5.25	3.27	3.10	5.73 $_{b}$
T_1	3.13 $_{ab}$	5.42	3.37	3.22	6.13 $_{ab}$
T_2	3.33	5.54	3.52	3.41	6.15 $_{ab}$
T_3	3.8 $_{ab}$	5.63	3.60	3.45	6.17 $_{ab}$
T_4	3.70 $_{a}$	5.80	3.65	3.54	6.62 $_{a}$

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Table 4 Percent Recovery of Catsup as Influenced by the Amount of Rimas in the Formulation

Treatment	Initial Weight (g)	Final Weight (g)	Yield (%)
T_0	994.94	607.25	61.03
T_1	994.94	631.92	63.54
T_2	994.94	661.92	66.47
T_3	994.94	669.70	67.31
T_4	994.94	686.20	69.00

Table 5 Consumers Acceptability towards Rimas Catsup

Sample	LIKE		DISLIKE		NO COMMENT		Total Respondents
	No. of Respondents	%	No. of Respondents	%	No. of Respondents	%	
RC (Rimas Catsup)	39	39	15	15	0	0	54
CC (Commercial Catsup)	41	41	5	5	0	0	46
							100

Table 6 Ingredients Used in Making Rimas Catsup (Their Price, Volume and Unit Price)

Items	Price(P)	Volume (ml or g)	Unit Price (P/ml or g)
Rimas	0.50	400	
Vinegar	37.50	950	0.039
Sugar	25.00	1000	0.025
Onion, Fresh	72.00	1000	0.072
Salt	11.25	115	0.09
Onion powder	25.50	37	0.69
Cinnamon	22.00	30	0.73
Garlic Powder	35.00	46	0.89
Pepper Labuyo	1.00	4	0.25
Food color	10.50	50	0.21
Gas	230.00	1100	0.02
Bottle	0.25	1pc	0.25

Table 7 Cost and Return Analysis of Catsup as Affected by the levels of Rimas in the Mixture.

Treatment	Total Expense	Gross income	Price/bot. 250 ml	Profit
T_0- 100:0 - Banana:rimas	P91.80	P166.48	P22.95	P74.60
T_1 - 75:25 -	87:24	183.12	21.81	95.60
T_2 - 50:50 - Banana:rimas	83.44	194.12	20.86	110.80
T_3 - 25:75 -	79.60	222.00	19.90	142.40
T_4 – 0:100 - Banana:rimas	75.80	222.00	18.95	143.00S

CONCLUSION

Rimas catsup possessed thephysico-chemical qualities which is very much useful for rimas catsup production. The sensory qualities of rimas catsup is comparable with the control (T_0). Likewise, the proximate composition of rimas catsup is relatively better than the control (T_0) and cost of producing rimas catsup is very much lower than the control. Therefore, rimas is potential for catsup production.

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