PROCESSING OF SWEET POTATO IN PALAU

BY: LYDIA M. MARERO and THOMAS TARO

Published by the Cooperative Research and Extension
Palau Community College
P.O. Box 9, Koror, Palau 96940

2013
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Processing of Sweet Potato in Palau

Lydia Marero
Thomas Taro

Palau Community College
2013
I welcome this opportunity to recognize the efforts of researchers from the Palau Community College to write this book on the “Processing of Sweet Potato in Palau”

A research on the “Processing of Root Crops in the Republic of Palau” was funded by the Hatch Act of 1887 administered by the National Institute of Food and Agriculture-United States Department of Agriculture (NI-FA-USDA), one of the programs of the Land Grant College of Micronesia.

Sweet potato is a nutritious food especially for the populations of Micronesia, as well as the Pacific Region. Its utilization into various food products can benefit the people of Palau and the surrounding countries in the Region.

Dr. Singeru Singeo
Executive Director
College of Micronesia Land Grant Programs
In an effort to contribute to the improvement of our plunging economic condition, the Palau Community College-Cooperative Research and Extension (PCC-CRE) has implemented applied researches that can help farmers in converting farm resources like sweet potatoes into value-added processed food products. Development of processed sweet potato food products will ensure a stable supply that will redound to food security in Palau.

PCC-CRE is tasked to teach ways to preserve foods through its extension programs like Expanded Food and Nutrition Education Program (EFNEP) and Food Technology Classes.

The process of raising local foods will not only help directly in upgrading the nutritional status of the people, but also lessen the demand on the family income, allowing local food production to contribute to the widening gap between imported and local food supplies.

This publication can help food processors with product ideas that will enhance their local production for consumers and tourists who are always looking for processed local foods.

PATRICK U. TELLEI, EdD
President
Palau Community College
ACKNOWLEDGMENTS

For making this publication possible, due acknowledgments are extended to:

Palau Community College-Cooperative Research and Extension Department and Dr. Singeru Singeo Executive Director, College of Micronesia Land Grant Programs for administrative support and for facilitating the funding of the printing of this book;

Dr. Nelson M. Esguerra for painstakingly editing the book;

Food tasters during sensory evaluation of the processed products for their valuable comments in the improvement and reformulation of the foods prepared from sweet potato;

Graphic Design: Ian C. Auacay

CRE staff Dr. Aurora del Rosario, Dr. Nelson Esguerra, Felix Sengebau, Maria Teruzi, Dilyaur Franz, Franzon Oiterung, Itwong Ngiraikelau, Habeam Madlutk, Leory Franz, Dalton Thomas, Tyler Tellei, Rusky Remoket, Leilani Rechelluul, Lavenda Oshima, Lyndon Masami and Kazue Joseph for their various support in the conduct of this research.

LYDIA M. MARERO
THOMAS TARO
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INTRODUCTION

Sweet potato (*Ipomea batatas* (L.) Lam), locally known as “chemutii”, ranks third among root crops eaten in Palau. This crop is always available as it is produced year-round.

A project under Hatch Act of the Pacific Land Grant on the “Processing of Root Crops in the Republic of Palau” has opened the possibilities for the processing of sweet potatoes into food products that can keep long and can have potentials for food business opportunities.

Production of sweet potatoes in Palau must have increased by this time, as there are more farmers tilling land in the different States due to the accessibility of transport facilities brought about by the completion of the Compact Road.

Research and extension activities of PCC-CRE such as Expanded Food and Nutrition Education Program (EFNEP) and Food Technology Classes can boost the utilization of sweet potatoes in alleviating malnutrition among the 0-7 age group of the population.

A survey in Micronesia in 1997 revealed a significant number of children under 5 years of age as wasting (low weight-for-height, 7%) or stunting (low height-for-age, 39.6%)(Plan of Work, COM-LGP). It is understood that the amount and type of available foods affect part of youth malnutrition. It is advocated that the process of raising local foods like sweet potato, will not only help directly through providing increased amounts and types of quality foods, but also lessen the demand on the family income, allowing locally produced foods to be purchased in the market.

The R & D Station in Ngermeskang Hamlet of Ngeremlengui State in Palau has served as the repository of twenty four (24) varieties of sweet potatoes grown in Palau (Del Rosario, 2001).

All the 24 varieties of sweet potatoes were used in the product development activities at the Food Technology Laboratory of the R & D Station.
In 1998, the Palau Statistical Yearbook reported that 13,404 lbs of sweet potatoes were harvested and sold for $10,053.00. (IESL, 1996).

Production and propagation of sweet potatoes in Palau contributes to the food basket, thus lessening large food importation. The increase in the consumption of imported foods in Palau has led to an overall decline in local food production resulting in trade imbalance. R & D efforts of PCC-CRE was thus focused on the production and utilization of local foods like sweet potatoes to deter the fast decline in the Gross Domestic Product (GDP) from the agriculture sector..

Table 1 shows the cooked colors of the different varieties of sweet potatoes in Palau.

Sweet potato varieties with purple-colored corms like Oisca and Bertakl, and dark orange varieties such as Kangkum, Ningsing, and Telentud, as well as the rich green leaves contain high amounts of anthocyanins. This phytochemical is reported to have various physiological functions in the body, because of their anti-oxidant and anti-cancer properties and protection against liver injury (Eastwood and Morris, 1992).
Table 1. Cooked colors of the sweet potato varieties at R & D Station.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Color (cooked)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bent 1</td>
<td>pale yellow</td>
</tr>
<tr>
<td>Bent 2</td>
<td>dark yellow with purple tinge</td>
</tr>
<tr>
<td>Bent 3</td>
<td>white with red edge</td>
</tr>
<tr>
<td>Bertakl</td>
<td>purple edge with yellow center</td>
</tr>
<tr>
<td>Dirradid</td>
<td>pale yellow</td>
</tr>
<tr>
<td>Guam Orange</td>
<td>orange</td>
</tr>
<tr>
<td>Guam White</td>
<td>dark yellow</td>
</tr>
<tr>
<td>Hawaiian</td>
<td>dark yellow</td>
</tr>
<tr>
<td>Ishiobing</td>
<td>dark yellow</td>
</tr>
<tr>
<td>Kangkum 1</td>
<td>dark orange</td>
</tr>
<tr>
<td>Kangkum 2</td>
<td>white</td>
</tr>
<tr>
<td>Ngaraard</td>
<td>pale yellow</td>
</tr>
<tr>
<td>Nikangets</td>
<td>pale yellow</td>
</tr>
<tr>
<td>Ningsing</td>
<td>dark orange</td>
</tr>
<tr>
<td>Oisca</td>
<td>purple</td>
</tr>
<tr>
<td>Oreor 1</td>
<td>white</td>
</tr>
<tr>
<td>Oreor 2</td>
<td>white</td>
</tr>
<tr>
<td>Sers</td>
<td>dark yellow</td>
</tr>
<tr>
<td>Siakl</td>
<td>dark yellow</td>
</tr>
<tr>
<td>Sment</td>
<td>pale yellow</td>
</tr>
<tr>
<td>Tainung</td>
<td>dark yellow</td>
</tr>
<tr>
<td>Techebot</td>
<td>dark cream</td>
</tr>
<tr>
<td>Telekeok</td>
<td>pale yellow</td>
</tr>
<tr>
<td>Telentud</td>
<td>dark orange</td>
</tr>
</tbody>
</table>
Table 2 shows the nutritional composition of different colors of sweet potatoes, such as purple, white, and yellow. The high energy value of sweet potatoes make them good sources of carbohydrates, with 30% and fiber, 3.0%. (Dreher, 1987).

Sweet potatoes contain good amounts of phosphorus (39 mg%) and calcium especially the white variety with 83 mg%.

Of the three colors of cooked sweet potatoes, only the yellow variety contained beta carotene (280 mg%). All three colors of sweet potatoes contain thiamin (0.07 mg%), riboflavin (0.02mg%), niacin (1.1 mg%) and ascorbic acid (29 mg%).
Table 2. Nutritional composition of cooked sweet potatoes.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Purple</th>
<th>White</th>
<th>Yellow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edible portion, %</td>
<td>90</td>
<td>86</td>
<td>86</td>
</tr>
<tr>
<td>Water, %</td>
<td>68.6</td>
<td>68.8</td>
<td>68.1</td>
</tr>
<tr>
<td>Energy, kcal</td>
<td>122</td>
<td>126</td>
<td>128</td>
</tr>
<tr>
<td>Protein, %</td>
<td>0.6</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Fat, %</td>
<td>0.2</td>
<td>0.8</td>
<td>0.3</td>
</tr>
<tr>
<td>Carbohydrate, %</td>
<td>29.5</td>
<td>29.3</td>
<td>30.7</td>
</tr>
<tr>
<td>Crude Fiber, %</td>
<td>0.7</td>
<td>2.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Ash, %</td>
<td>1.1</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>Calcium, mg%</td>
<td>22</td>
<td>83</td>
<td>30</td>
</tr>
<tr>
<td>Phosphorus, mg%</td>
<td>39</td>
<td>37</td>
<td>26</td>
</tr>
<tr>
<td>Iron, mg%</td>
<td>0.2</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>Retinol, mg%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>B-carotene, mg%</td>
<td>20</td>
<td>5</td>
<td>280</td>
</tr>
<tr>
<td>Total Vit. A (RE), mcg%</td>
<td>3</td>
<td>1</td>
<td>47</td>
</tr>
<tr>
<td>Thiamin, mg%</td>
<td>0.04</td>
<td>0.07</td>
<td>0.04</td>
</tr>
<tr>
<td>Riboflavin, mg%</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Niacin, mg%</td>
<td>1.1</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Ascorbic acid, mg%</td>
<td>29</td>
<td>23</td>
<td>14</td>
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Adapted from FNRI, 1987.
Fig. 1. Flour prepared from purple sweet potato.

Ingredients:
Sweet potato, any variety

Procedure:
• Clean and wash sweet potato corms.
• Boil sweet potato for 1 hour, peel and rinse.
• Grind sweet potato in a food processor or any grinder or grate.
• Dry sweet potato in the sun until crisp.
• Blend/grind dried sweet potato until fine and sift.
• Pack in thick (0.5 mil) plastic bags, seal, and label.
• Store at room temperature (27° to 32° C) in a clean, dry place.
Fig. 2. Sweet potato pancake mix.

Ingredients:
- 2 cups sweet potato flour
- 2 cups all-purpose flour
- 1 cup sugar
- 1 cup dry milk
- ¼ cup baking powder
- 1 tsp. salt

Procedure:
- Mix together all ingredients in a plastic bag.
- Pack 1 cup mixture in thick (0.5 mil) plastic bags, seal and label. Store in a clean, dry place.
Sweet Potato Pancakes

Ingredients:
1 pack Sweet Potato Pancake Mix
1 pc egg
½ cup water
¼ cup oil

Procedure:
• Mix all ingredients in a mixing bowl to form a batter.
• Pour ¼ cup batter into frying pans, cook both sides until brown. Serve pancakes with syrup, jam, margarine, or peanut butter.

Fig. 3. Sweet potato pancakes.
Fig. 4. Sweet potato steamed cake mix.

**Ingredients:**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1/2</td>
<td>cups</td>
<td>sweet potato flour</td>
</tr>
<tr>
<td>2-1/2</td>
<td>cups</td>
<td>all-purpose flour</td>
</tr>
<tr>
<td>2</td>
<td>cups</td>
<td>sugar</td>
</tr>
<tr>
<td>1/4</td>
<td>cup</td>
<td>baking powder</td>
</tr>
<tr>
<td>1</td>
<td>pack</td>
<td>coconut powder</td>
</tr>
</tbody>
</table>

**Procedure:**

- Mix all ingredients in a plastic bag.
- Measure 1 cup mixture and pack in thick plastic bags, seal, label and store in a clean, dry place.
Fig. 5 Sweet potato steamed cakes.

**Ingredients:**
- 1 pack Sweet Potato Steamed Cake Mix
- ¾ cup water
- 1 Tbsp grated cheese

**Procedure:**
- Mix Sweet Potato Steamed Cake Mix with water
- Transfer ¼ cup mixture into muffin pans. Top with grated cheese.
- Steam for 20 minutes.
Fig. 6. Sweet potato doughnut mix.

Ingredients:
3 cups sweet potato flour
3 cups all-purpose flour
1 cup dry milk
1 cup sugar
4 Tbsp. baking powder
1/2 tsp. nutmeg powder
1/2 tsp. cinnamon powder

Procedure:
• Mix all ingredients in a plastic bag.
• Pack one cup (240 g) in thick (0.5 mil) plastic bag, seal, and label.
• Store in a clean, dry place.
**Fig. 7.** Sweet potato doughnuts.

**Ingredients:**
- 1 pack Sweet Potato Doughnut Mix
- 1 pc egg
- 2 Tbsp. oil

**Procedure:**
- Empty 1 pack Sweet Potato Doughnut Mix into a mixing bowl, add 1 egg and 2 Tbsp. oil.
- Knead and divide dough into 6 balls.
- Flatten thickly and cut with doughnut cutter or form into rings.
- Deep fry in hot oil.
Fig. 8. Sweet potato tama mix.

Ingredients:
3 cups sweet potato flour
3 cups all-purpose flour
1 cup dry milk
1 cup sugar
4 Tbsp. baking powder
1/2 tsp. nutmeg powder
1/2 tsp. cinnamon powder

Procedure:
• Mix all ingredients in a plastic bag.
• Pack one cup (240 g) in thick (0.5 mil) plastic bag, seal, and label.
• Store in a clean, dry place.
Fig. 9. Sweet potato tama.

**Ingredients:**
- 1 pack Sweet Potato Tama Mix
- 1 pc egg
- 2 Tbsp. oil

**Procedure:**
- Empty 1 pack Sweet potato tama mix into a mixing bowl, add 1 egg and 2 Tbsp. oil.
- Knead and divide dough into 6 balls.
- Deep fry in hot oil.
Fig. 10. Sweet potato pasta mix.

**Ingredients:**
- 2-1/2 cups sweet potato flour
- 2-1/2 cups all-purpose flour
- 1 Tbsp. salt

**Procedure:**
- Mix all ingredients in a plastic bag. Shake bag well to obtain a uniform mixture.
- Pack 1 cup mixture in a thick plastic bag, seal, label, and store in a clean, dry place.
Fig. 11  Sweet potato pasta.

Ingredients:
1 pack  Sweet Potato Pasta Mix
1 pc  egg

Procedure:
- Empty 1 pack of sweet potato pasta mix into a mixing bowl, add 1 egg, and mix well to form dough.
- Roll dough on a floured cutting board with a rolling pin, and cut into pasta with a knife.
- Drop sweet potato pasta in boiling water and cook until pasta floats (about 2 minutes).
- Drain, add 1 Tbsp. oil, and toss.
Fig. 12. Sweet potato pasta with sauce.

**Ingredients:**
- 1 cup chicken, cooked, and diced
- ¼ cup onion, chopped
- 1 Tbsp. garlic, minced
- ¼ tsp. black pepper
- 1 can Nestle’s Cream
- 1 Tbsp. oil
- 1 cup chicken stock
- sprig parsley or green onions

**Procedure:**
- Saute garlic, onion, and chicken in vegetable oil.
- Add chicken stock, salt, pepper, and Nestle’s cream.
- Cook for 5 minutes.
- Pour over cooked pasta. Garnish with parsley or chopped green onions.
Fig. 13. Sweet potato cookie mix.

**Ingredients:**
- 6 cups sweet potato flour
- 6 cups all-purpose flour
- ¼ cup baking powder

**Procedure:**
- Mix all ingredients in a plastic bag and shake well to obtain a uniform mixture.
- Measure 4 cups of Sweet potato cookie mix into thick (0.5 mil) plastic bags, seal, and label.
- Store in a clean, dry place.
Fig. 14. Sweet potato cookies

**Ingredients:**
1 pack Sweet Potato Cookie Mix
1 cup (2 sticks) margarine
1 cup sugar
3 pcs eggs
1 Tbsp. vanilla

**Procedure:**
- Cream margarine with 1 cup sugar.
- Add eggs, one at a time, and mix well.
- Add 1 Tbsp. vanilla and mix well.
- Empty 1 pack Sweet potato cookie mix into the mixture, and knead into dough.
- Roll with a rolling pin and cut with cookie cutter.
- Bake sweet potato cookies at 275° F for 45 min.
- Pack in thick plastic bags, seal, and label.
Fig. 15. Sweet potato brownie mix

**Ingredients:**
- 3 cups sweet potato flour
- 3 cups all-purpose flour
- 3 tsp. baking soda
- 3 cups cocoa powder
- 3 tsp. salt

**Procedure:**
- Mix all ingredients in a plastic bag.
- Measure 2 cups mixture and pack in thick (0.5 mil) plastic bags, seal, and label.
- Store at room temperature in a clean, dry place.
Fig 16. Sweet potato brownies

**Ingredients:**

1 pack Sweet Potato Brownie Mix
1 cup butter
2 cups sugar
3 pcs. eggs
1 tsp. vanilla
1 cup chopped nuts

**Procedure:**

- Cream butter, then add sugar gradually.
- Add eggs one at a time mixing very well after each addition.
  Mix in vanilla.
- Add 1 pack Sweet Potato Brownie Mix and mix well.
- Add 1/8 cup chopped nuts.
- Pour mixture into greased pan. Smoothen surface with a rubber scraper and top with the remaining nuts.
- Bake at 350° F for 15 minutes.
Ingredients:
3 cups sweet potato flour
3 cups all-purpose flour
4 tsp. baking soda
1 tsp. salt

Procedure:
• Mix all ingredients in a plastic bag.
• Measure 2 cups mixture and pack in thick plastic bags, seal, and label.
• Store at room temperature in a clean, dry place.
Fig. 18 Sweet potato muffins

**Ingredients:**
- 1 pack Sweet Potato Muffin Mix
- ½ cup raisins, chopped
- ½ cup nuts, chopped
- 1 cup yoghurt
- 1 pc. egg
- 2 Tbsp. margarine
- ½ cup brown sugar

**Procedure:**
- Preheat oven to 350°F.
- Combine margarine, egg, and yoghurt. Add 1 pack Sweet Potato Muffin Mix and mix with a few strokes.
- Fold in chopped nuts and raisins.
- Fill greased muffin pans ½ full.
- Bake at 350°F for 20 min. or until toothpick comes out clean.
Fig. 19. Sweet potato bread mix

**Ingredients:**
10 cups sweet potato flour
10 cups all-purpose flour
1 cup dry milk
1 cup sugar
1 tsp. salt

**Procedure:**
- Mix all ingredients in a plastic bag.
- Measure 5 cups mixture, pack in thick plastic bags, seal, and label.
- Store at room temperature in a clean, dry place.
Fig. 20. Sweet potato bread.

**Ingredients:**
- 1 pack Sweet Potato Bread Mix
- 2-½ tsp. yeast
- 1 cup lukewarm, water
- 2 Tbsp. brown sugar
- ¼ cup shortening

**Procedure:**
- Dissolve yeast and brown sugar in 1 cup lukewarm water. Let stand for 10 minutes or until foamy.
- Add yeast solution to 1 pack of sweet potato bread mix, knead until dough is smooth.
- Place in a dark place covered with wet paper towel, and let rise for one hour.
- Shape and arrange on baking sheets. Let rise for one hour.
- Bake at 375° F for 25 minutes.
Fig. 21. Sweet potato cupcake mix

**Ingredients:**

- 5 cups sweet potato flour
- 5 cups all-purpose flour
- 5 tsp. baking powder
- 5 tsp. salt

**Procedure:**

- Mix all ingredients in a plastic bag.
- Measure 2 cups mixture, pack in thick plastic bags, seal, and label.
- Store at room temperature in a clean, dry place.
Fig. 22. Sweet potato cupcakes.

**Ingredients:**
- 1 pack Sweet Potato Cupcake Mix
- ½ cup sugar
- ¼ cup butter
- 2 pcs eggs
- 3 Tbsp. nuts, chopped
- 1 tsp. vanilla

**Procedure:**
- Beat margarine until fluffy. Add sugar gradually and eggs one at a time. Add sweet potato cupcake mix and nuts and mix well.
- Pour ¾ full in muffin pans line with cupcake paper. Top with chopped nuts.
- Bake in a pre-heated oven at 350° F for 35 min.
SWEET POTATO FRIES

Fig. 23. Sweet potato fries

**Ingredients:**
- 2 lbs. sweet potatoes
- oil for frying

**Procedure:**
- Peel sweet potatoes and slice longitudinally.
- Fry in deep, hot oil.
Fig. 24. Sweet potato chips.

**Ingredients:**
- 2 lbs sweet potatoes
- 1 cup sugar
- oil for frying

**Procedure:**
- Peel and wash sweet potatoes.
- Slice thinly a food processor.
- Deep-fry in deep oil (first frying)
- Soak fried chips in syrup made of 1 cup sugar dissolved in 1 cup boiling water.
- Deep fry in hot oil (second frying) until crisp.
- Cool, pack, seal and label.
Fig. 25  Sweet potato cake

**Ingredients:**
- 3 cups grated sweet potatoes
- 1 cup coconut milk
- 1 cup brown sugar
- 2 Tbsp. grated cheese
- 1 can condensed milk

**Procedure:**
- Wash, peel, and grate sweet potatoes and measure.
- Mix tapioca, coconut milk, and brown sugar and steam for 45 minutes.
- Pour condensed milk over steamed sweet potato, top with cheese and put in the broiler part of the oven, then broil until top is brown.
Fig. 26. Sweet potato pastilles

Ingredients:
- 2 lbs sweet potatoes, boiled and grated
- 1 can condensed milk
- 1 can evaporated milk
- 1 cup dry milk
- 2 cups sugar
- ¼ cup margarine

Procedure:
- Boil sweet potatoes for 1 hour, peel and grate.
- Transfer to a big skillet and mix the other ingredients together.
- Cook with constant stirring in slow fire until very thick.
- Wrap 1 Tbsp in colored cellophane or tissue.
Fig. 27. Sweet potato salad.

**Ingredients:**

- 2 lbs. sweet potato slice
- ½ tsp salt
- ⅓ cup yoghurt
- ½ tsp pepper
- ¼ cup mayonnaise
- 2 pcs eggs, diced
- ¼ cup chicken broth
- 3 Tbsp vinegar
- 4 pcs. spring onion, chopped

**Procedure:**

- Boil sweet potato for 1 hour, peel and slice
- Combine all ingredients with the diced sweet potato.
- Toss until uniformly mixed.
- Garnish with diced boiled egg,
Fig. 28. Sweet potato hash browns.

**Ingredients:**
- 2 lbs. sweet potato, cooked and diced
- 1 pc. onion, chopped
- 1 pc bell pepper, chopped
- 1 clove garlic
- 1 Tbsp. olive oil
- ¾ tsp. salt
- ½ tsp. pepper

**Procedure:**
- Cook sweet potato for 1 hour, peel, and dice. Saute garlic, onion, and green pepper in oil.
- Add sweet potato and season with salt and pepper.
Fig. 29. Sweet potato pie.

Ingredients:

<table>
<thead>
<tr>
<th>Crust:</th>
<th>Filling:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-½ cups all-purpose flour</td>
<td>5 cups grated sweet potato</td>
</tr>
<tr>
<td>2-½ Tbsp. sugar</td>
<td>2 cups coconut</td>
</tr>
<tr>
<td>1/2 tsp salt</td>
<td>1 cup cream</td>
</tr>
<tr>
<td>¾ cup shortening</td>
<td>1 cup flour</td>
</tr>
<tr>
<td>1/3 cup ice-cold water</td>
<td>2/3 cup sugar</td>
</tr>
<tr>
<td>1 pc egg yolk</td>
<td>3 Tbsp. butter</td>
</tr>
</tbody>
</table>
Procedure:
Crust:
• Combine flour, sugar and salt in a mixing bowl. Cut in shortening until mixture is crumbly. Mix in cold water and slightly beaten egg yolk.
• Knead into a dough, form into a ball, and refrigerate for 30 minutes.

Filling:
• Stir together all ingredients and transfer into a dough-lined pie plate, cover with flattened dough and cut edges with fork tines.
• Bake at 375°F for 45 to 59 minutes.
SWEET POTATO PASTRY

Fig. 30. Sweet potato pastry

Ingredients:

<table>
<thead>
<tr>
<th>Filling:</th>
<th>Wrapper:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 lbs sweet potato, grated</td>
<td>3 cups all-purpose flour</td>
</tr>
<tr>
<td>3 cups sugar</td>
<td>¾ cup oil</td>
</tr>
<tr>
<td>¾ cup water</td>
<td>¾ cup water</td>
</tr>
<tr>
<td>1 bundle spring onions, chopped</td>
<td></td>
</tr>
</tbody>
</table>

Procedure:

- Wrapper: Mix wrapper ingredients and set for 10 minutes.
- Roll dough, flatten, and cut into pieces.
- Filling: Stir-fry pork until brown, put in onions and mix well.
- Add rest of the ingredients and stir while cooking.
- Wrap 1 Tbsp filling and bake at 350 F for 20 minutes.
Fig. 31. Sweet potato turnover.

**Ingredients:**

**Wrapper:**
- 1 cup flour
- 1 Tbsp. sugar
- ½ tsp. baking powder
- ¼ tsp. salt
- 3 Tbsp. butter
- 2 Tbsp. Shortening
- 1/3 cup ice water
- 4 Tbsp. yoghurt

**Filling:**
- 4 cups sweet potato
- 1 cup chicken, diced
- 1 can green peas
- 1 Tbsp. cooking oil
- 1 tsp. garlic
- 2 Tbsp. onion
- 1/2 tsp. salt
- 1/2 tsp black pepper

**Procedure:**

Wrapper:
- Combine flour, sugar, baking powder, and salt.
- Cut in shortening and butter until mixture is like a coarse meal.
- Stir in yoghurt and sprinkle on ice water, shape into a dough and refrigerate 1 hour.
Filling:
• Saute garlic and onion in oil. Add chicken, sweet potato, and green peas.
• Season with salt and pepper.
• Wrap 2 Tbsp. mixture in round-shaped wrappers and seal edges with fork tines.
• Fry in deep oil.
Fig. 32. Sweet potato wine.

Ingredients:
5 lbs. sweet potatoes, boiled and grated
5 cups sugar
20 cups water
2 Tbsp. yeast
1 Tbsp. brown sugar

Procedure:
• Boil sweet potatoes in water for 1 hour, peel and cut into small pieces.
• Place 1 cup sweet potato and 1 cup water in a blender and blend for 2 minutes. This is sweet potato puree.
• Dissolve yeast in 1 cup lukewarm water and add brown sugar. Let stand 10 minutes or until foamy. Mix sweet potato puree with equal amount of water and stir in sugar and yeast solution.
• Transfer the mixture to a bottle and cover with paper towel secured with a rubber band. Ferment for 1 month and filter. The filtrate is sweet potato wine. Pasteurize sweet potato wine by heating to 90° C for 15 minutes. Cool, bottle, seal, and label.
Fig. 33. Sweet potato vinegar

**Ingredients:**
- 5 lbs. sweet potato, boiled and grated
- 5 cups sugar
- 20 cups water
- 2 Tbsp. yeast
- 1 Tbsp. brown sugar

**Procedure:**
- Boil sweet potato in water for 1 hour, peel and cut into small pieces and blend to make puree.
- Dissolve yeast in 1 cup lukewarm water. Mix sweet potato puree with equal amount of water and stir in sugar and yeast solution. Transfer the mixture to a bottle and cover with paper towel secured with a rubber band.
- Ferment for 3 months and filter. Pasteurize at 90°C for 15 minutes. Cool, bottle, seal and label.
SENSORY EVALUATION OF SWEET POTATO PRODUCTS

Sweet potato products like cookies were evaluated by about 5,000 respondents in the span of five years. The products were served to the public during events like Earth Day, Career Awareness Week, Women’s Month, Tourism Week, Olechotel Belau Fair (OBF), World Food Day, Independence Day, as well as a main visitors’ item at the PCC-CRE R & D Station during tours, served to school children, students, parents, teachers, and other guests. All food tasters liked the products very well.

The food products, particularly the dry mixes, were put on exhibit at the 2002 and 2006 Japan Food Expo, Hawaii in 2006, Guam in 2007, and Italy Food Expo in 2007. During the 2006 “Taste of Palau” event, the tourists tasted the taro food products and they signified their interest in buying these foods if sold in the market.

Fig. 34. Taste test of sweet potato food products by school children visiting the R & D Station.
Sweet potato food products and their suitable packaging materials were studied and results are shown in Table 3.

Table 3. Selected food products and their suitable packaging materials.

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Packaging Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starch, flour, and flour products</td>
<td>polyethylene (PE) and polypropylene (PP) bags, 0.5 mil</td>
</tr>
<tr>
<td>Chips</td>
<td>PP bags, 0.5 mil</td>
</tr>
<tr>
<td>Ready-to-eat slices</td>
<td>PP bags, 0.5 mil</td>
</tr>
<tr>
<td>Fermented products</td>
<td>PET polyethylene terephthalate) plastic bottles</td>
</tr>
</tbody>
</table>

Sweet potato flour and dry mixes were found stable when packed in 0.5 mil thick PE or PP bags and stored at room temperature. Sweet potato chips were found stable in 0.5 mil PE plastic bags.
The processed products kept well in their respective suitable packaging materials for a period of one year or longer for the dried products.

Sweet potato flour and dry mixes also kept for one year or longer at room temperature (27°C to 32°C) when packed in thick (0.5 mil) plastic bags.

Baked/cooked/fried sweet potato products like cookies and chips, had a shelf-life of one month at room temperature (27°C-32°C).

Fermented products like wine and vinegar, packed in PET bottles were found to be stable at room temperature (27°C-32°C) for more than 2 years or longer.
Selected sweet potato food products were taught to 636 participants in PCC-CRE Food Technology Classes in a 24-hour training period, usually done in a three-week, 2-hour per day sessions. The number of participants and places of training are shown in Table 4.

Among the trained participants, some went into a food business microenterprise. School chefs served some of the processed food products at the PCC Cafeteria and elementary schools of Ngeremlengui, Melekeok, and Ngiwal States.

Other trainees served the food items during custom events like funerals and birth ceremonies. Women prepared the products for their families, guests, and tourists visiting their places.
Table 4. Places and number of participants of Food Technology Classes

<table>
<thead>
<tr>
<th>Place</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ngeremlengui State Old Age Center</td>
<td>23</td>
</tr>
<tr>
<td>Melekeok State Old Age Center</td>
<td>17</td>
</tr>
<tr>
<td>Airai State Ked Center</td>
<td>19</td>
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<tr>
<td>Airai State Abai</td>
<td>17</td>
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<tr>
<td>Koror State PCC Campus</td>
<td>18</td>
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<tr>
<td>Koror State Ngarachamayong Cultural Center</td>
<td>16</td>
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<tr>
<td>Koror State Maibrel Center</td>
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<tr>
<td>Ngeremlengui State Old Age Center</td>
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</tr>
<tr>
<td>Ngeremlengui State Training Center</td>
<td>23</td>
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<tr>
<td>Ngiwal State School Cafeteria</td>
<td>23</td>
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<tr>
<td>Ngatpang State</td>
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<td>Ngerbeched, Koror</td>
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<td>Kayangel State</td>
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<tr>
<td>Peleliu State</td>
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<td>Ngeremlengui Elementary School</td>
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<td>Emmaus High School</td>
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<td>Palau High School Special Education</td>
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<tr>
<td>Bethania High School</td>
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<tr>
<td>Expats Group II</td>
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<tr>
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<tr>
<td>Ngaraard Ongall Group</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>636</strong></td>
</tr>
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</table>
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Plan of work, COM-LGP FY 2000-2004. College of Micronesia Land Grant Programs, Research, Extension, and Educational Programs.
ABOUT THE AUTHORS

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Lydia Marero worked as Researcher-Food Technologist at the Palau Community College-Cooperative Research and Extension (PCC-CRE) for ten years. She developed about 150 processed food products from taro, cassava, sweet potato, fish, coconut, and banana and taught food technology classes as an extension program of PCC-CRE. She obtained three USDA grants for her projects on the utilization of root crops and product development of local foods and rabbit fish. A food scientist, an educator and a scholar, Lydia earned a Bachelor’s Degree in Food Technology at the De La Salle-Araneta University Foundation, graduating cum laude. Under a PCARRD scholarship, she pursued a Master’s Degree in Food Science at the University of the Philippines in Los Baños. She obtained her Doctoral Degree in Food Science from the Ochanomizu Women’s University in Tokyo, Japan as a Monbusho scholar and JSPS fellow. She further obtained a Post-Doctoral Degree in Food Science as a KOSEF fellow at the Seoul National University in South Korea.

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