

## **BIBLIOGRAPHY**

COMNANG, CLARA D. APRIL 2012. Different Root Crops as Ingredient for Embutido. Benguet State University, La Trinidad, Benguet.

Adviser: Jones K. Feleciano, EdD.

## **ABSTRACT**

The study was conducted to determine the acceptability of embutido processed with different root crops; to determine the production cost and profitability; to determine the nutrient content and the shelf life of the products.

A total of 25 panelists were invited to evaluate the processed embutido with different root crops. The panels of tasters were composed of five persons from students, teachers, house wives, employees and food servers.

The products were evaluated in terms of appearance, tenderness, juiciness acceptability and aroma. As for tenderness, embutido with carrots, ube and sugar beets were rated very tender, while embutido with carrots and sweet potato was rated by the panelists as moderately tender. In terms of appearance, the panelist rated embutido processed with carrots, sweet potato, and sugar beets as very good and embutido with ube as good. For juiciness, all of the products were rated as moderately juicy. For acceptability embutido with carrots, sweet potato, sugar beets were rated as like very much while embutido with ube was rated as like moderately. For aroma like very much were the verbal



description for embutido with carrots, embutido with sweet potato and embutido with sugar beets. And for embutido with ube it was rated with like moderately.

Nonetheless, results of statistical analysis revealed that there were no significant differences among the treatments.

The shelf life of the products was evaluated under room temperature. The products with carrot, ube and sweet potato deteriorated three days from the time of processing as exhibited by the presence molds and its foul odor, except for the embutido with sugar beets which deteriorated on the fourth day. The shelf life evaluation started on May 9, 2011 and ended on May 13, 2011 which was the deterioration of all the treatments.



## INTRODUCTION

Food preferences are influenced by many interacting factors, such as income, culture, concerns about health, social values and religions. Yet for most persons and in ordinary circumstances, food must be palatable or have appetite appeal if they are to be eaten. Learning to prepare foods with great appetite appeal includes learning to discriminate and evaluate the quality of food through the intensity of the sensations received when food is sampled.

Meat like any food can be prepared in various ways to enhance its appetite appeal. One of the meat-based dishes is embutido, a Filipino style meat loaf.

Embutido is one of the most favorite Filipino dishes. It can be served as cold cuts; lightly pan sliced pieces or fried the whole then slice. Different root crops like ube, sugar beets and sweet potato can be a substitute for carrot. These root crops would add flavors, colors, and nutrients that we could not get from carrots. Since all of them have a unique taste and unique nutrient contents that are needed by our body.

Root crops such as ube, carrots, sugar beets sweet potato are rich in nutrients that make our body healthy. These are also used as herbal medicines. Sugar beets have been shown to lessen tumor cells. Recent studies have likewise shown the superior ability of sweet potatoes to raise our blood levels of vitamin A. Carrots on the other hand are an excellent source of anti oxidant and many more health benefits that root crops can give. The main reason why we change carrot and substitute it with other root crops is to explore and make new recipe, to satisfy the taste of consumers and we can get other nutrients that are not present in carrot alone (Anonymous 2001).



This study is to provide knowledge and information to processors who are interested to engage in Embutido making with the use of different root crops like ube, sugar beet and sweet potato as extenders in place of carrot.

This was conducted to determine the acceptability of Embutido processed with different root crops, to determine the production cost and profitability, and to determine the nutrient content and shelf life of the products.

This study was conducted at the Meat Processing Laboratory, Department of Animal Science College of Agriculture, Benguet State University, La Trinidad, Benguet from May to June 2011.



## REVIEW OF LITERATURE

In 1983, Ibarra stated three reasons why man eats meat. First it provides satiety unequalled to other food items. An individual who eats meat with a meat dish feels satisfied for a long period. Secondly is meat can be prepared in variety of ways that is why it can never be monotonous to taste of consumer. There are many recipes where meat is utilized singly or in combination with other food items. Meat is probably the only single food material which can be prepared in many ways. Third, meat provides nutrient almost in the proportion and amount needed by a human body, especially in terms of protein. He also mentioned however that meat is highly perishable. Without proper handling when exposed to surroundings, spoilage will readily occur.

According to Labensky and Hause (2003) Standardized recipes are not found in books or provided by manufacturers. They are recipe customized to your operation. A recipe must be tested repeatedly and adjusted to fit your facility and your needs before it can be considered standardized. They also added that modern food preservation, storage and transportation technique have made both fresh exotic foods regularly available to chefs and consumers.

Staub (1982) Stated that embutido is a ground pork dish with seasoning garnish rolled and wrapped in leaf or *panyu-panyu* and being steamed. It is served in slice like meat loaf. Well flavored juicy meat with minimum loss of shrinkage. Steaming under pressure is fast and easy, saves on energy and provides accurate meat proportioning and cost control.

Dio-al (2005) said that when steaming meat, minimum shrinkage occurs and it is one of the healthiest methods of cooking because no additional fat is used. Although water



is used in the process as in boiling, the meat retains more nutrients because it does not sit directly in water, preventing the nutrient from being leached out from the meat.

### Carrot

The nutrient content of 1 serving or 122g of fresh Carrot (*Daucus carota*) is as follows (USDA National Nutrient Database for Standard Reference, 2011):

<u>Component</u>	<u>Nutrient Value</u>
Water	107.71 g
Calories	50
Protein	1.13 g
Carbohydrates	11.69 g
Fiber	3.4 g
Sugars	5.54 g
Total Fat	0.29 g
Saturated Fat	0.045 g
Monounsaturated Fat	0.017 g
Polyunsaturated Fat	0.143 g
Calcium	40 mg
Iron	0.37 mg
Magnesium	15 mg
Phosphorus	43 mg
Potassium	390 mg
Sodium	84 mg
Zinc	0.29 mg



Vitamin C	7.2 mg
Thiamin	0.081 mg
Riboflavin	0.071 mg
Niacin	1.199 mg
Pantothenic Acid	0.333 mg
Vitamin B <sub>6</sub>	0.168 mg
Folate	23 mcg
Vitamin A	20509 IU
Vitamin E	0.81 mg
Vitamin K	16.1 mcg
Beta Carotene	10108 mcg
Beta Cryptoxanthin	153 mcg
Lycopene	1 mcg
Lutein and Zeaxanthin	312 mcg

### Ube

Ensminger *et. al.* (1983) Yams are a good source of vitamin B<sub>6</sub>. This vitamin is needed by the body to break down a substance called homocysteine, which can directly damage blood vessel walls. Individuals who suffer a heart attack despite having normal or even low cholesterol levels are often found to have high levels of homocysteine. Since high homocysteine levels are significantly associated with increased risk of heart attack and stroke, having a good supply Vitamin B<sub>6</sub> on hand makes a great deal of sense. High intakes of vitamin B<sub>6</sub> have also been shown to reduce the risk of heart disease.



Anonymous (2001) Stated that yams' complex carbohydrates and fiber deliver the goods gradually, slowing the rate at which their sugars are released and absorbed into the bloodstream. In addition, because they're rich in fiber, yams fill you up without filling out your hips and waistline. And one more benefit, yams are a good source of manganese, a trace mineral that helps with carbohydrate metabolism and is a cofactor in a number of enzymes important in energy production and antioxidant defenses.

The nutrient content of 1 serving or 125g of fresh Yam (*Dioscorea alata*) is as follows (USDA National Nutrient Database for Standard Reference, 2011):

2001)

<u>Component</u>	<u>Nutrient Value</u>
Calories	177
Protein	2.3g
Carbohydrate	41.8g
Total Fat	0.25g
6.1g Fiber	6.1g
Potassium	1224mg
Vitamin C	25.6mg
Vitamin B6	0.44mg
Thiamine	0.168mg





## Sweet Potato

Anonymous (2005) Cited that sweet potatoes have been found to contain a high amount of anti-oxidant, making it suitable in combating inflammatory problems like asthma, arthritis, gout. When we are stressed, our metabolic rate rises, causing the body potassium levels to be reduced. By snacking on the potassium-packed sweet potato, it helps to rebalance the vital mineral, and helps normalize the heartbeat. This in turn sends oxygen to the brain and regulates the body's water balance. High potassium root helps to prevent heart attack and stroke. It helps maintain fluid and electrolyte balance in the body cells, as well as normal heart function and blood pressure.

The nutrient content of 1 serving or 77g of Sweet potato (*Ipomoea batatas*), baked, with skin is as follows (The George Mateljan Foundation, 2001):

<u>Component</u>	<u>Nutrient</u>
<u>Value</u>	
Calories	95.39
Vitamin A	13107.70IU
Vitamin C	17.06 mg
Manganese	0.52 mg
Copper	0.26 mg
Dietary fiber	3.14 g
Vitamin B6 (pyridoxine)	0.25 mg
Potassium	306.05 mg
Iron	1.46 mg



## Sugar Beets

Relf D. and McDaniel. (2009) stated that beets may be grown for both their greens and their roots. They are heavy yielders and high in iron and vitamins. Beets come in several color and shapes. In addition to the standard dark red, orange and white varieties are available. The lighter varieties do not bleed their color as readily, but are less attractive in canning jars and on the plate than the red ones. Round beets are most common, but flat and oblong types are grown as well. Flat and round beets tend to be early maturing varieties, while the long cylindrical beets are usually late maturing. They also added that the beet seed is actually a fruit with one to four seeds enclosed. Thinning is usually necessary for this reason. Crushing them lightly with a rolling pin will allow individual seed to separate and reduce the amount of thinning required. Soaking the fruits may enhance germination. Plant at three-week intervals for a continuous harvest.

The nutrient content of 1 serving or 100g of Sugar Beets (*Beta vulgaris*), raw is as follows (USDA National Nutrient data base, 2009):

<u>Component</u>	<u>Nutrient Value</u>
Carbohydrates	9.56 g
Protein	1.61 g
Total Fat	0.17 g
Dietary Fiber	2.80 g
Folates	109 mcg
Niacin	0.334 mg
Pantothenic acid	0.155 mg
Pyridoxine	0.067 mg



Riboflavin	0.057 mg
Thiamin	0.031 mg
Vitamin A	33 IU
Vitamin C	4.9 mg
Vitamin E	0.04 mg
Vitamin K	0.2 mcg
Sodium	78 mg
Potassium	325 mg
Calcium	16 mg
Copper	0.075 mg
Iron	0.80 mg
Magnesium	23 mg
Manganese	0.329 mg
Zinc	0.35 mg
Carotene-β	20 mcg
Betaine	128.7 mg



## MATERIALS AND METHODS

The study used the following common ingredients of embutido namely: ground refined salt, ground black pepper, onion, raisins, hotdog, cornstarch, garlic, sugar, eggs, bread crumbs, soy sauce, cheese and cooking oil.

In addition to these common ingredients of embutido, this research study used as carrots, ube, sweet potato and sugar beets. These root crops were assigned to the different treatments and served as treatments.

The utensils include the following: refrigerator, weighing scale, cooking stove, steamer, mixing bowl, measuring spoons and cups, chopping board, knives, pan and spatula.

The same ingredients were used in all treatments except for the root crop added to them. The treatments are as follows:

T<sub>0</sub>-usual embutido ingredient with 250grams fresh grated carrots (Figures 1 to 3)

T<sub>1</sub>- usual embutido ingredient with 250 grams fresh grated ube (Figures 4to 6)

T<sub>2</sub>- usual embutido ingredient with 250grams fresh grated sweet potato (Figures 7 to 9)

T<sub>3</sub>- usual embutido ingredient with 250 g grams fresh grated sugar beets (Figures 10 to 12)

### Procedure in Making Embutido

Experimental treatments. There were four treatments in the study and each treatment was replicated three times. One kilogram of ground pork was used for each replication. The ingredients (Table 1) were measured, added and mixed with the meat by hand until the mixture became tacky.





Figure 1. 250g Grated carrots



Figure 2. Mixture of all ingredients



Figure 3. Processed product



Figure 4. 250g Grated ube



Figure 5. Mixture of all ingredients



Figure 6. Processed product



Figure 7. 250g Grated sweet potato



Figure 8. Mixture of all ingredients



Figure 9. Processed product



Figure 10. 250g Sugar beets



Figure 11. Mixture of all ingredients



Figure 12. Processed product



The mixture (Figures 2, 5, 8 and 11) was spread in an aluminum foil (250gms), allowing one inch on each side. The said mixture was rolled on both ends and steamed for one hour. After it was removed from the steamer and cooled (Figures 3, 6, 9 and 12). It was later chilled in the refrigerator, unwrapped and fried until golden brown.

Organoleptic test. Each cooked samples (Figures 13 to 16) was sliced and subjected to acceptability taste by three sets panel of tasters which represented each replicate in the treatments. Each set of panel composed of five teachers, five students, five expert food servers, five house wives and five employees. Each member of the panel was given score cards for their respective ratings for each treatment.

Table 1. Ingredients used for every kilogram of meat.

CURING MIX	SEASONINGS	TREATMENTS
Salt and pepper	1cup finely chopped hotdog	250g grated carrots
	½ cup sweet relish	250g grated ube
	3 whole eggs	250g grated sweet potato
	½ cup grated cheese	250g grated sugar beets
	2 tbsp. corn starch	
	½ cup raisins	
	1bulb garlic	
	1 onion bulb chopped finely	
	2 tbsp. sugar	
	3tbsp. bread crumbs	
	2 tbsp. soy sauce	





Figure 13. Embutido with carrots after deep frying



Figure 14. Embutido with ube after deep frying



Figure 15. Embutido with sweet potato after deep frying



Figure 16. Embutido with sugar beets after deep frying

The data gathered were:

1. Appearance of the product. This was evaluated using the scale below:

<u>Score</u>	<u>Remarks</u>
1	Very good
2	Good
3	Fair

2. Tenderness of the product. This was evaluated using the scale below:

<u>Score</u>	<u>Remarks</u>
1	Very Tender
2	Moderately Tender
3	Tough

3. Juiciness of the product. This was evaluated using the scale below:

<u>Score</u>	<u>Remarks</u>
1	Very Juicy
2	Moderately Juicy
3	Not Juicy

4. Acceptability of the product. This was evaluated using the scale below:

<u>Score</u>	<u>Remarks</u>
1	Like Very Much
2	Like Moderately
3	Dislike

5. Aroma of the product. This was evaluated using the scale below:

<u>Score</u>	<u>Remarks</u>
1	Very pleasing
2	Moderately pleasing
3	Not pleasing

6. Shelf Life. This was determined at room temperature from the time the embutido was processed until growth of molds was observed.



7. Total Cost Production (TCP). This was computed by getting the total of the direct cost and indirect cost.
8. Nutrition facts. This was obtained by the DOST-CAR Km6, La Trinidad, Benguet.
9. Return on Investment. This was obtained by dividing the net income by total cost of production and multiplied by 100.



## RESULTS AND DISCUSSION

### Appearance

Table 2 shows the result of the evaluation of the tasters on the appearance of embutido processed with different root crops. Result show that embutido processed with carrots, sweet potato and sugar beets were all rated very good while embutido with ube was rated good.

Statistical analysis shows no significant differences among treatments. There was difference in numerical and verbal description, but was not enough to cause a significant deviation.

### Tenderness

Table 3 shows the tenderness of embutido as evaluated by the panelists. The embutido with carrots, ube and sugar beets were rated very tender, while the embutido with sweet potato was rated moderately tender.

Statistical analysis revealed no significant differences among treatments. There was difference in numerical and verbal description, but was not enough to cause a significant differences.

Table 2. Appearance of embutido

TREATMENT	MEAN	DESCRIPTION
Embutido with carrots	1.32	Very Good
Embutido with ube	1.59	Good
Embutido with sweet potato	1.39	Very Good
Embutido with sugar beets	1.35	Very Good



Table 3. Tenderness of embutido

TREATMENT	MEAN	DESCRIPTION
Embutido with carrots	1.46	Moderately Tender
Embutido with ube	1.43	Very Tender
Embutido with sweet potato	1.59	Moderately Tender
Embutido with sugar beets	1.39	Very Tender

### Juiciness

Table 4 shows that embutido in different treatments were all rated as moderately juicy by the panelists. Numerically, they had differences, embutido processed with carrots had 1.69, embutido with ube had 1.71, embutido with sweet potato had 1.73 and embutido with sugarbeets had 1.65. based on the verbal description of the tasters, the products under the different treatments were all moderately juicy, thus, resulting to no significant differences among the treatments.

### Acceptability

Table 5 shows the acceptability evaluation of embutido with different root crops. Embutido with carrots, embutido with sweet potato and embutido with sugar beets were rated likely very much while embutido with ube was rated like moderately. Analysis revealed that there are no significant differences among treatments. There was difference in numerical and verbal description, but was not enough to cause a significant deviation.



Table 4. Juiciness of embutido

TREATMENT	MEAN	DESCRIPTION
Embutido with carrots	1.69	Moderately Juicy
Embutido with ube	1.71	Moderately Juicy
Embutido with sweet potato	1.73	Moderately Juicy
Embutido with sugar beets	1.65	Moderately Juicy

Table 5. Acceptability of embutido

TREATMENT	MEAN	DESCRIPTION
Embutido with carrots	1.39	Like Very Much
Embutido with ube	1.56	Like Moderately
Embutido with Sweet Potato	1.44	Like Very Much
Embutido with Sugar Beets	1.47	Like Very Much

### Aroma

Table 6 revealed the result of the aroma as affected by different treatments. It shows that embutido with carrots, embutido with sweet potato and embutido with sugar beets were rated by the panelists very pleasing, but based on the numerical value embutido processed with carrots had the highest value for aroma, and moderately pleasing was the verbal description for embutido with ube.

Analysis shows no significant differences among treatments. This implies that the different treatments did not affect the aroma of the products.



Table 6. Aroma of embutido

TREATMENT	MEAN	DESCRIPTION
Embutido with carrots	1.36	Very Pleasing
Embutido with ube	1.57	Moderately Pleasing
Embutido with Sweet Potato	1.4	Very Pleasing
Embutido with Sugar Beets	1.47	Very Pleasing

### Shelf Life Evaluation

The processed products were observed on the number of days molds appeared. Embutido with carrots (Figure 17), ube (Figure 18) and sweet potato (Figure 19) exhibited molds on the 3<sup>rd</sup> day, while embutido with sugar beets exhibited molds on the 4<sup>th</sup> day (Figure 20).

### Total Cost of Processed products

The cost of production (Table 7) shows the expenses incurred in processing embutido. Differences on the expenses incurred in producing embutido are attributed to the differences in prices of the extenders used. The embutido with sugarbeets had the highest expense of 323.8225 pesos, while embutido with sweet potato had the lowest expense of 316.3425 pesos.





Table 7. Total cost of processed embutido per kilogram (Php)

INGREDIENTS	EMBUTIDO PROCESSED WITH 250g CARROTS	EMBUTIDO PROCESSED WITH 250g UBE	EMBUTIDO PROCESSED WITH 250g SWEET POTATO	EMBUTIDO PROCESSED WITH 250g SUGAR BEETS
Refined salt	0.14	0.14	0.14	0.14
Onion	4.44	4.44	4.44	4.44
Raisins	2.50	2.50	2.50	2.50
Hotdog	27.50	27.50	27.50	27.50
Cornstarch	1.50	1.50	1.50	1.50
Eggs	8.67	8.67	8.67	8.67
Soy	0.68	0.68	0.68	0.68
Cheese	20.25	20.25	20.25	20.25
Bread Crumbs	6.50	6.50	6.50	6.50
Cooking oil	10.83	10.83	10.83	10.83
Garlic	5.00	5.00	5.00	5.00
Pickle relish	13.25	13.25	13.25	13.25
Magic sarap	5.00	5.00	5.00	5.00
Pork meat	180	180	180	180
Sugar	1.19	1.19	1.19	1.19
Carrot	12.50	-	-	-
Ube	-	13	-	-
Sweet potato	-	-	10	-
Sugar Beets	-	-	-	17
Direct cost	299.95	300.45	297.45	307.45
Indirect cost	18.9975	19.0225	18.8725	19.3725
Total cost of Production (php)	318.9475	319.4725	316.3425	323.8225
Gross Income	325	325	325	325
Net Income	6.0525	5.5275	8.6575	1.1775
ROI (%)	1.90	1.73	2.74	0.36





Figure 17. Appearance of embutido with carrots at 3<sup>rd</sup> day



Figure 18. Appearance of embutido with ube at 3<sup>rd</sup> day



Figure 19. Appearance of embutido with sweet potato at 3<sup>rd</sup> day

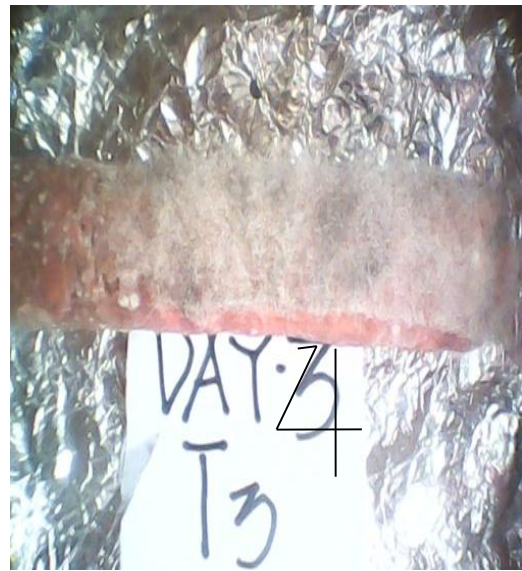


Figure 20. Appearance of embutido with sugar beets at 4<sup>th</sup> day

## Nutrition Fact Analysis

Table 8 shows the result of the nutritional content analysis of embutido processed with different root crops as analyzed by the Department of Science and Technology, Km.6, La Trinidad, Benguet.

Ash content. Embutido with sweet potato had 2.56% in every 250 grams, embutido with sugar beets had 2.07%, embutido with carrots had 1.95% and embutido with ube has 1.40%.

Carbohydrates content. Embutido with sweet potato had 20.24% followed by embutido with sugar beets with 15.85%, embutido with carrots with 12.60% and embutido with ube with 12.44%.

Crude fat content. Embutido with ube had 9.51%, followed by embutido with sweet potato had 8.19%, embutido with carrots had 7.89% and embutido with sugar beets had 6.46%.

Crude protein content. Embutido with carrots had 13.6%, then embutido with ube had 12.9%, embutido with sugar beets had 11.32% and embutido with sweet potato had 9.29%.

Moisture content. Embutido with ube had 64.56%, followed by embutido with carrots had 64.51%, embutido with sugar beets had 64.30% and embutido with sweet potato had 59.72%.

Energy content. Embutido with sweet potato had 192kcal, followed by embutido with ube which is 184kcal, then embutido with carrots which is 174kcal, and lastly the embutido with sugar beets which contains 167kcal.



Table 8. Nutrition Facts Analysis as analyzed by the DOST

NUTRIENT CONTENT	EMBUTIDO PROCESSED WITH 250g CARROTS	EMBUTIDO PROCESSED WITH 250g UBE	EMBUTIDO PROCESSED WITH 250g SWEET POTATO	EMBUTIDO PROCESSED WITH 250g SUGAR BEETS
Ash, %	1.95	1.40	2.56	2.07
Carbohydrate, %	12.60	12.44	20.24	15.85
Crude Fat, %	7.89	9.51	8.19	6.46
Crude protein, %	13.06	12.09	9.29	11.32
Moisture, %	64.51	64.56	59.72	64.30
Energy, kcal	174	184	192	167



## SUMMARY, CONCLUSION AND RECOMMENDATION

### Summary

This was conducted at the Meat Processing Laboratory, Department of Animal Science, College of Agriculture, Benguet State University, La Trinidad, Benguet. The study was conducted to determine the acceptability of embutido processed with different root crops, to determine the production cost and profitability, to determine the nutrient content and to determine the shelf life of the products. A total of 25 panelists were invited to evaluate the processed embutido with different root crops. The panels of tasters are composed of five persons from students, teachers, house wives, employees and food servers.

The products were evaluated in terms of appearance, tenderness, juiciness acceptability and aroma. As for tenderness, embutido with carrots, ube and sugar beets were rated very tender while embutido with carrots and sweet potato was rated by the panelists as moderately tender. In terms of appearance the panelist rated embutido processed with carrots, sweet potato, and sugar beets as very good and embutido with ube as good. For juiciness, all of the products were rated as moderately juicy. For acceptability embutido with carrots, sweet potato, sugar beets were rated as like very much while embutido with ube was rated as like moderately. For aroma, embutido with carrots, embutido with sweet potato and embutido with sugar beets were rated like very much, while embutido with ube it was rated like moderately.

Nonetheless, results of statistical analysis revealed that there were no significant differences among the treatments.



The shelf life of the products was evaluated under room temperature. The products with carrot, ube and sweet potato deteriorated three days from the time of processing as exhibited by the presence molds and its foul odor, except for the embutido with sugar beets which deteriorated on the fourth day. The shelf life evaluation started on May 9, 2011 and ended on May 13, 2011 which was the deterioration of all the treatments.

### Conclusion

Based on the result of the study it is concluded that ube, sweet potato and sugar beets can be used as alternative extenders for embutido. It is also concluded that the use of sweet potato as extender can lower the cost production. In addition, adding sugar beets could lengthen the shelf life of the product and its reddish color enhances the appearance of the product which makes it more attractive.

### Recommendation

To maximize profit, it is recommended that sweet potato be used as extender for embutido because of its lower price as compared to carrots, ube and sugar beets. Based on the result of organoleptic test by the tasters, it is generally acceptable. Thus, guaranteeing its marketability and viability in the market. Moreover, it contains the highest energy content (192kcal) as compared to other root crops used.

Even so, the other root crops could still be used as extenders for embutido to provide consumers choices. Not to mention, consumers have different preferences.

Since this study is limited only on the data provided and gathered, it is recommended that further studies be conducted to validate the results.



## LITERATURE CITED

ANONYMOUS. 2001. The World's Healthiest Food. Retrieved April 21, 2011 from <http://www.whfoods.com>.

ANONYMOUS. 2005. Sweet Potato Nutrition Information and Facts. Retrieved May 6, 2011 from <http://www.juicing-for-health.com/carrot-nutrition.html>.

DIO-AL, T. D. 2005. Evaluation of different Meat as Embutido. BS Thesis. Benguet State University, La Trinidad Benguet. P4.

ESMINGER A.H. ME Ensminger, JE Kondale, JRK Robson. 1983 Foods and Nutrition Encyclopedia. Pegus Press, Clovis, California 1983.

IBARRA, P. I. 1983. Meat Processing for Small and Medium Care Operations. University of the Philippines. Los Banos, Laguna. Pp. 182-189.

LABENSKY and HAUSE 2003. On Cooking, Techniques from Expert Chefs. 3<sup>rd</sup> Edition. New Jersey 07458.

RELF D. AND McDANIEL A. 2009. Root Crops Home Virginia Cooperative Extension. Virginia State University. Retrieved May 4, 2011. <Http://pubs.ext.vt.edu/426/426-422/426-422.html>.

STAUB, A. 1982. The Science of Philippine Foods 2nd Edition. Abanido Enterprise. Araneta Center Quezon City, Philippines. P338

The MATELJAN FOUNDATION. 2011. Sweet Potato Nutrition information and Facts. [http://en.wikipedia.org/wiki/Sweet\\_Potato](http://en.wikipedia.org/wiki/Sweet_Potato).

UNITED STATES FOOD and DRUGS ADMINISTRATION 2009. Beets Nutrition Facts. <http://en.wikipedia.org/wiki/beet>.

UNITED STATES FOOD and DRUGS ADMINISTRATION 2009. Nutrition: Nutrient content of Ube. <http://en.wikipedia.org/wiki/yam>.

UNITED STATES FOOD and DRUGS ADMINISTRATION 2009. Juicing for health Carrot Nutrition Fact. <http://en.wikipedia.org/wiki/carrot>.

