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Development of an Enriched Lubi-Lubi (*Ficus pseudopalma*) Noodles

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Abstract - This research is focused on the development and acceptability of an enriched lubi-lubi (*Ficus pseudopalma)* noodle utilizing its puree as indigenous ingredients. Noodles were developed and enriched using lubi-lubi leaves. The level of acceptability was determined to find out the degree of acceptance of the noodles among consumers. Experimental method was used by extracting the puree of lubi-lubi leaves and used as flavor and packed/stored in polyethylene bag. Of the three trials conducted the enriched lubi-lubi noodles with ingredients of 250 g of Lubi-lubi leaves puree, 325 g APF, 10 g salt, 150 g eggs and 2 g vegetable oil, 187.5 water was rated much acceptable. Based on acceptability level, trial 2 was rated as much acceptable as to taste and color and acceptable as to texture and odor. Sensory evaluation was done by the panelist using standard score sheets. Acceptability factors such as color, texture, flavor and odor were included among the choices. Results were obtained across prepared products, indicating the evident taste and aroma of lubi-lubi leaves through varied degree depending upon the quantity of puree used.

The researchers observed correct mixing methods or techniques used flavorings and other materials that nicely blended with lubi-lubi puree as suggested by evaluators; the accepted ones were then standardized. The researchers concluded that lubi-lubi leaves are potential flavoring in the preparation of enriched lubi-lubi noodles and accepted among consumers. The proximate analysis of the developed enriched noodles in terms of moisture content, ash content, fiber content, protein content, fat content, carbohydrate content and shelf-life is highly recommended for the developed product to compete with the other commercial veggie noodles. Further research is still needed to address other gaps revealed by the research.

Keywords - Technology, lubi-lubi leaves, puree, lubi-lubi noodles, ficus Psuedopalma, acceptability, enriched lubi-lubi noodles , Sorsogon City, Philippines

INTRODUCTION

Providing optimum health to children in terms of physical, social, and intellectual development should be a priority concern of everybody. Today consumers are nutrition literate, believing that food can enhance their health promoting ingredients in their diets, increasing awareness of consumers on the nutrient contents. In a world where nothing stays the same, it would seem that the usual diet and nutrition of humans have through the years been wanting in the elements to keep one's body healthy and in shape. This may be particularly true for developing and less developed countries like the Philippines. Food consumption in the country has been generally influenced by the following attributes in the order of importance; price, taste, product quality, brand name, and availability, advertisement, and product promotions. Rarely do consumers care for nutrition facts and almost always go for foods that are light on the pocket and heavy in the stomach. This would seem to be reasonable words to live by given one's meager budget and physiological need of satisfying hunger and thirst.

The nutrition situation in the Philippines shows a continued existence of chronic under nutrition manifested by protein-energy malnutrition and deficiency in iron, vitamin A and Iodine. This

situation is complicated by the emergence of over nutrition and chronic degenerative diseases such as cardiovascular diseases, hypertension, diabetes, cancer and others.

Undernutrion is a pathological state resulting from the consumption of an inadequate of food over an extended period of time. Findings of the Nutrition survey conducted by the FNRI showed that under nutrition continue to afflict the Filipino people, and among these are protein-energy malnutrition (PEM) particularly among pre-school children, iron deficiency anemia, vitamin A deficiency and iodine deficiency disorder.[3] This may be due to 1) poverty for low income family have inadequate food intake both in quantity and quality. 2) Poor food intake or composition due to the rice-vegetable fish diet pattern of Filipinos, rice being the country's staple food.3) Poor distribution of food supply. 4) Large family size. 5) Low level of education among household members6) Intra familial food distribution.7) Urbanization 8) widespread incidence of infectious diseases and parasitism due to poor sanitation and 8) Wrong infant feeding and weaning practices. [Claudio] (1996.)

The province of Sorsogon is abundant in its natural resources before and even today, only that it needs to be tilt and developed. Indigenous plants are still found on the said province only that, individual nowadays take it for granted due to what we call industrialization. People nowadays always look for a ready to eat food, it is maybe because most of the mothers are working mom's that's why too difficult and tiring on their part if coming from the office they still do some household chores, while others look for fast food chains, others lean on the packed, bottled, canned and ready to cook or eat food. Despite of the fact that indigenous plants had been set aside already by some of the Filipinos, there are still others who showed their interest in the processing of the indigenous materials, in which it can solely found in their backyard. Having a vegetable garden in the backyard can help augment the financial aspects of every family and in a little way, can supplement the needed micronutrient of every individual specifically it is an inorganic vegetable.

Lubi-lubi (Ficus pseudopalma) or sometimes called as nyog nyogan has an erect, glabrous, unbranched shrub growing to a height of 5 meters. Leaves are crowded at the end of the stems, sprea and short

petiole, oblanceolate with a cordate base and an acute apex. Blade is coracious and dark green, coarsely tooth growing to more than 25 centimeter long. The Fruit is ovoid, angular, up to 4 cm long, on short peduncles and crowded at axils of the leaves. The leaves and the fruits leave a pattern of scars on the trunk. (Barley and barley)this plant grows abundantly in the Bicol Region and other places of the country. Each region has its common name, like in Tagalog; it is known as nyog-nyogan, lubi-lubi in bicol and lamiyog in Visayas.

For several years now, lubilubi has been commonly used by the Bicolanos as herbal medicines. According to Guerrero (1980) the leaves when prepared in poultices are said to have sedative and healing properties. Prepared as an alcoholate, they are said to alleviate neuralgic pains. The fruit itself is reported to be a cure for diabetes, because eating them tends to reduce the sugar in blood.

Aside from this, lubi-lubi leaves contains a higher percentage of cellulose, an insoluble fiber which helps in healing constipation and reduce the risk of colon cancer. Foods naturally high in fiber can be considered to bring about improvement in the gastrointestinal health, reduction of hypertension and coronary heart disease factors. Not only this, it also helps reduce the risk of developing some cancers (Tessa Salazar 2008).

Filipino consumers make noodles as one of their favorite dishes whatever occasions they celebrated, noodles are always part of it. Noodle is a symbol of life and good health. To the well off family, maybe lasagna is commonly prepared, for mediocre families, spaghetti will do while for ordinary families, pancit is usually prepared. Noodles were originated in China and introduced to us by Chinese merchants and since then the Chinese has become a part of every Filipino festive preparations.

Considering the health benefits of fiber rich lubi-lubi leaves, this gave the researcher the drive to develop lubi-lubi leaves as flavor in noodles preparation. This is one of the answers to reduce the risk of some of the world's most prevalent diseases, particularly the onset of some types of cancer.

FRAMEWORK

The National Nutrition Council recently developed a Philippine Nutrition Country Profile with funding from the Food and Agriculture Organization of the United Nations. Findings showed that, just like 20 years ago, the biggest problems are protein-energy malnutrition (PEM) and micronutrient deficiencies. Paralleling the general trend in poverty statistics, there was a decline in the prevalence of malnutrition during mid-1990s, followed by gradual increases beginning in 1998. There are now approximately (32%) preschool children who are underweight-for-age, (20%) adolescents who are underweight-for-age and (13.2%) adults who are chronically energy deficient. Vitamin A deficiency is a serious problem, with 7% of pregnant women and 8% of infants under six months being severely deficient. Iron deficiency anemia affects 57% of infants, 51% of pregnant women, and 46% of lactating women.

The primary cause of malnutrition is the inequitable distribution of food, which is related of course to poverty. The typical Filipino diet is grossly inadequate for energy and other nutrients, causing human bodies to compensate for inadequate energy intake by utilizing protein as an energy source; the usual result is PEM. This situation is unlikely to improve as long as an estimated 28 million Filipinos are unable to buy food to meet basic nutritional requirements.[2]

According to the American Dietetic Association (ADA) a vegetarian diet should consist of mainly whole grains, vegetables, legumes, fruits and nuts, vegetarian diet reduces the risk of obesity, heart disease, diabetes and osteoporosis, among many other health conditions. Many vegetarians are healthier because they also consume more fiber found in fruits, vegetables and legumes than non-vegetarians. The Harvard School of Public Health (HSPH) has found that a higher intake of fiber can decrease one's chances of contracting coronary disease by 40 percent. It also shows that regular fiber intake is linked to a decreased likelihood of diabetes, diverticular disease (an intestinal condition) and constipation."We must look to our farms, not to our pharmacies, for the durable solution to our national problems" cited by Florencio 2005, as advised by Dr. Gopolan 2005, especially those primarily agricultural countries, in the speech delivered with the theme "Prevention of micronutrient malnutrition."

The Food and Drug Administration has recognized fiber's importance by requiring it to be listed on the Nutrition Facts panel of food labels along with other key nutrients and calories. And, based on scientific evidence, the agency has approved four claims related to fiber intake like 1) Diets low in fat and rich in fiber-containing grain products, fruits, and vegetables may reduce the risk of some types of cancer. 2) Diets low in saturated fat and cholesterol and rich in fruits, vegetables, and grain products that contain fiber, particularly soluble fiber, may reduce the risk of coronary heart disease. 3) Diets low in fat and rich in fruits and vegetables, which are low-fat foods and may contain fiber or vitamin A (as beta-carotene) and vitamin C, may reduce the risk of some cancers.

In Brazil, non-governmental organizations utilizes alternative diet supplement known as multimixture (MM) composed of bran cereals, cassava leaf powder and eggshell powder. This study investigated the effectiveness of this MM supplement used concomitantly with other who consumed the same diet without MM. At the end of the study, the NGO intervention provided a beneficial effect on the nutritional status of children, since it improved their blood parameters and reduced the anemia independently of MM supplementation. The supplementation of the deficient diets with MM contributed significantly to the improvement of the children's stature.

Vegetables are important for everyone and are good sources of Vitamin A, C, E, and K, magnesium, potassium, phosphorus, selenium, calcium, and more. They are important for all sorts of organ functions; they help lower the risk of cancers and other diseases, and more. Healthy diets provide energy while fatty; junk food diets make one lethargic. Eating out is very much an Asian phenomenon, with street food sellers (called hawkers in some countries) selling everything from local burgers to traditional noodle-based fare forming an essential part of the Asian food landscape; in addition to stand-alone restaurants offering cuisines from all over the world. International fast-food chains have also become popular, and offer a quick and hygienic option for people on the more.

Eating more fiber will improve heart and digestive health, and there is evidence that increased fiber in the diet may prove to be a component in weight management. High fiber meals have been found to contribute

to satiation and satiety, which can help reduce the amount of calories consumed. While researchers have published studies showing these effects, no regulatory claims have been established, though structure-function claims may be possible. Processors should know that any claims must be stated according to strict FDA guidelines.

Noodles are long thin strip of pastas and are classified as staple food of Italian and Chinese cooking. Filipino consumers make noodles as one of their favorite dishes whatever occasions they celebrated, noodles are always part of it. Noodle is a symbol of life and good health. To the well off family, maybe lasagna is commonly prepared, for mediocre families, spaghetti will do while for ordinary families, pancit is usually prepared. Noodles were originated in China and introduced to us by Chinese merchants and since then the Chinese has become a part of every Filipino festive preparations.

The veggie noodles were originally developed by FNRI-DOST in response to prevailing nutritional problems in the country, particularly vitamin A deficiency (VAD), iodine deficiency disorders (IDD) and protein-energy malnutrition (PEM). However, in these times of increasing cost of flour, the vegetable components of the noodle also provide a good supplement to flour to lower production cost of the noodles.

The all-time favorite noodles are now made more nutritious having been enriched with different vegetables. The Food and Nutrition Research Institute of the Department of Science and Technology (FNRI-DOST) developed various types of noodles supplemented with squash, seaweeds and saluyot. These products fondly called veggie noodles are good sources of vitamin A, iodine, protein and other nutrients. Noodle products include spaghetti, canton, instant cup noodles, and fresh miki. Seaweed-supplemented noodle products include instant spaghetti with lato, canton with lato or guso,

President Gloria Macapagal Arroyo in her SONA last July 28, 2008, emphasized the importance of "Food for Every Filipino Families "She ordered Dr. Rogelio Colting, President of BSU (2008), to conduct extensive product development and studies on highland vegetables and to produce a variety of vegetable enriched noodles. As a result, BSU and RFM Foods Corporation launched a squash enriched pancit canton under the brand name Product Harvest on July 30, 2008 at

the "Tindahan Natin" outlet in Dagonoy Market, San Andres Bukid, Manila. Three thousand packs (3,000) were initially produced and marketed for P28.00 to P34.00 per 250 grams. The government granted ten million pesos (P10, 000.000.00) for the said product development and tied up with RFM Foods Corporation for the production and monitoring.

Tejada, said that vegetables will be integrated in the noodle production line to include malunggay, squash, carrots, mushrooms and other readily available vegetables and will be marketed as "veggie noodles." .Veggie breads and noodle technology has been promoted by the Food and Nutrition Research Institute (FNRI) of the DOST to address wheat substitute at the same time, will provide additional food supplement to noodles and breads which are common to the daily Filipino diet.

The popularity of noodles is evident in that adult and children alike consume it. It is taken as part of a meal or snacks food. Noodles are alimentary paste made primarily from wheat flour and other ingredients. There are per studies and researches on noodle manufacturing utilizing other ingredients as an alternative to wheat flour.

Tobias developed instant spaghetti with seaweeds. Trial formulations were conducted and the most accepted formulation was determined. Shelf life studied were conducted and the physio chemical microbial and sensory characteristics were evaluated.

In Japan, Skinny Noodles had been developed and with a brand name of Shirataki, a noodle shaped Konnyaku product and is produced from tubers of the Konnyaku root, a potato family, and has been an important ingredient of Japanese cuisine. The important value of the noodles unveiled dietary fiber and Konnyaku is very rich in soluble dietary fiber.

It is use as substitute for pasta dishes with other sauces. It is one of the most effective foods for defending oneself from obesity, In order to lose weight, it is necessary to reduce the caloric intake, eating Skinny Noodles (Shirataki) as part of the regular meal can absorbs toxic substances produced during digestion and helps to eliminate them before they can be absorbed in the blood stream.

Trinidad et.al. (2000) studied iron availability from instant noodles fortified with iron and vitamin A. Their study showed that the addition of EDTA to Fe sulfate and Fe fumerate, as well as NaFeEDTA enhance iron availability from instant noodles. Vitamin A enhanced the absorption of iron from pancit canton fortified with ferrous fumerateEdta. The result of their body is similar to what is studied.

Reyes (2007) came up with a study entitled "Development of Fiber and Protein Enriched Noodles", He utilizes coco residue and coco protein isolate blend to wheat flour. Optimum proportion was determined to come up with most acceptable formulation which has been evaluated through sensory evaluation and proximate analysis. Results showed that formulated noodles were highly accepted and product was stable for a period of six months.

Egar (2006) utilizes the sweet potato flour instead of wheat flour. Her ideas was on the art of combining two materials to find out whether there was a possibility of utilizing the sweet potato flour into different classification of cakes.

Payumo (1989), made use of high protein pandesal using a blend of wheat and mecah pea flour and wheat mungbean flour with 0.51 dough conditioner/emulsifier. This study combines two or more raw materials for the purpose of product enrichment, and utilizing of high protein materials.

Furthermore, the College of Technology Department, Bicol University presented the " Coco Noodles " during the 1st Regional Forum in Industry and Energy Research and Development held in the said University, as the word implies, coconut is one of the main ingredients in preparing the noodles.

Canton noodles are popular dishes in Asia, especially in the Philippines and can be found in many Asian Markets. They may be flat or round and vary widely in width, cooked and coiled dry, creating neat packets. Filipino families have their own versions of the said dishes with varying spice levels and ingredients. Some companies make canton noodles with additions like squash, and seaweed, to create their desired flavor, and these additives can also make canton noodles more nutritious.

Cordero (1980) conducted a chemical analysis of the lubilubi Leaves and they are as follows: Fats and chlorophyll 0.795, Resin (neutral) 0.357, Tannic Acid 0.006, Resin (acid) 3.402, Cellulose 65.930, Gummy Particles 0.471, Glucose 1.705, Mineral salt 10.140, Moisture 17.94, respectively.

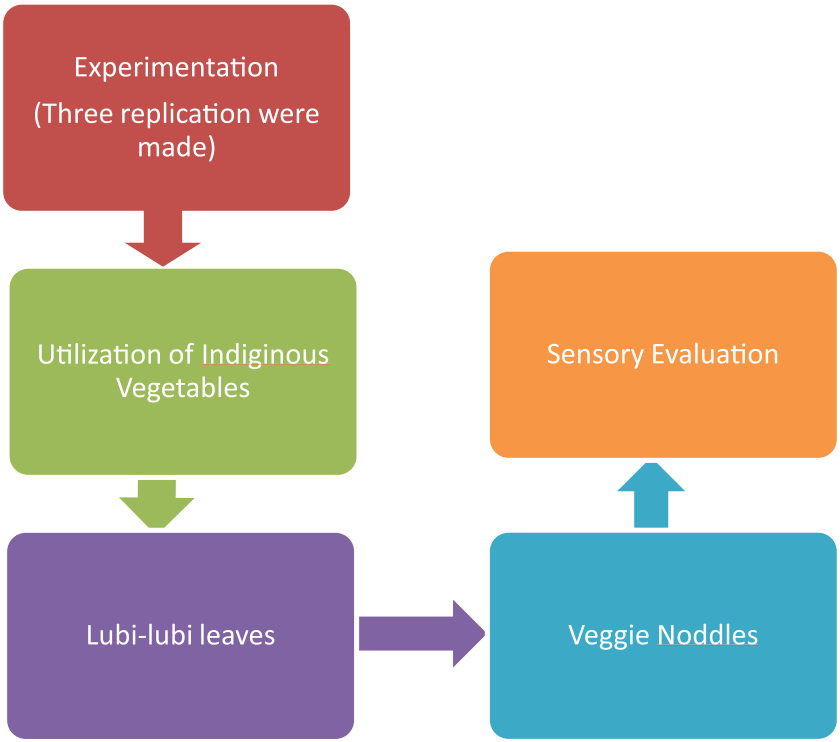
Results shown that lubi-lubi leaves are considered as highly fibrous. In recent years, public awareness of the health benefits of dietary fiber has increased along with its consumption in various high fiber food products. Numerous studies have reported that health problems linked to chronic ailments such as cardiovascular diseases and high cholesterol, colon cancer, diabetes, obesity and constipation can be reduced by increasing the consumption of whole grain or fiber enriched products. Whole grain and other sources of dietary fiber, long an important part of the human diet, gained new stature in 1999 when the US Food and Drug Administration authorized the following health claim: "Diet rich in whole grain foods and other plant foods and low in total fat, saturated fat and cholesterol, may help reduce the risk of heart disease and certain cancers.(Kantor and others 2001). A recent food industry report mentioned "high fiber" as one of the ten functional trends in the U.S. market (Sloan 2006) with the increasing awareness of the benefits of dietary fiber, the demand for functional high fiber foods, is expected to continue.

The aforementioned literature and studies of the lubi-lubi leaves has a bearing to the present study of the researchers. Using it as an added ingredient for a processed food product and retaining its benefits as an herb.

It should also be noted that there is another kind of plant with the same name-lubi-lubi (Solanum nigrumlinn). Though the leaves can be eaten and has a therapeutic cure for many diseases, the fruit is believed to be toxic in some ways. In this study, the researchers use the other kind of lubi-lubi which is commonly called as Nyog-nyogan with the scientific name Ficus pseudopalma.

With the in depth analysis of the aforementioned studies, it was noted that most of the studies focused on the developmental products specifically veggie noodles and its relevance to nutritional status of the country specifically the micro nutrients deficiency problems encountered by the country and importance of fibers to one's health.

Neither perhaps addressing the said problem for the purpose of eradicating nor lessen if cannot be totally eradicated is necessary. Hence the gap and intention for this study.



SIGNIFICANCE OF THE STUDY

The findings of this study may benefit the following end users:

Children - Veggie noodles can be a better solution for children not eating vegetables and prefer noodles instead. Using veggie noodles for various recipes can be inviting and tempting to the children.

Farmers - Demand of indigenous plants will guarantee them of a regular income.

Consumer - It will provide new, improved quality products suited to their preferences as to the qualitative or sensory qualities of the finished products. Veggie noodles will mean lesser food expenses, and can prepare rich and palatable dishes within the budget.

Processor - The findings of this study will not only be useful in food industry sector but transfer of technology is important in this region. It will further contribute to the noodle processor industry by proving new technology of innovation in the field of science and technology and new product would mean a business venture and market partners.

Students - They are inspired to research and come up with innovative food material utilizing indigenous plants. The transfer of technology from school to home will mean new knowledge and skills not to forget the additional income as well.

Future Researchers - The important findings in this study would serve as a basis for other studies applied in the field of science and technology related to food processing. Likewise the study may help and challenge researchers on the technological changes and knowledge explosion towards research advancement technology necessary today utilizing indigenous plant resources and develop their ingenuity to pursue further studies and contribute to proper nutrition and food sufficiency program.

Expected output and Derivable

Convenience Pack of Lubi-lubi noodles.

OBJECTIVES OF THE STUDY

The objectives of the study are the following: (1) to develop a fiber enriched lubi-lubi noodles; (2) to determine the strength of acceptability of the developed enriched noodles to the consumers; (3) to produce convenience pack of lubi-lubi noodles.

MATERIALS AND METHODS

The indigenous plants were purchased directly from the farmers of Castilla Sorsogon and other nearby municipality. Young and green leaves who are already open or stalk of the leaves which are still soft in feature are the one needed and harvested in the early morning of the day between 5:00 to 8:00 am for the raw materials are still considered as fresh. On the other hand, non fresh lubi-lubi leaves will become wilted and difficulty in the extraction of puree will be encountered. The researchers bring it to the laboratory area of the Food Service Management for the experimentation at the Sorsogon State College, Sorsogon Campus.

Young and green leaves were carefully selected, washed and weighted and made into puree. Green young leaves used are already open and can be found on the 3rd to 5th layer of the plants from its upper tip. Young leaves for acridity and bitterness were not yet fully developed; color is brown green that can be observed in the finished product. Puree was utilized in the preparation of veggie noodles based on the proportion made and three replications were made.

The sensory evaluation was conducted using the 9 point hedonic scale. Hedonic scaling was used to determine the degree of likeness or dislike to the developed noodles. The data obtained from the evaluation was used in the calculation for the analysis of variance (ANOVA). The aim was to determine the significant difference of the developed lubi-lubi noodles.

Statistical Treatment

There are statistical treatments employed by the researchers during the analysis and interpretation of the data collected. The following statistical tools were used:

9 Point Hedonic Scale – This is to determine the degree of likeness or dislike to develop lubi-lubi noodles.

Analysis of Variance (ANOVA) – This was used to determine the significant difference of the developed lubi-lubi noodles to the consumers.

Frequency – refers to the count to tally the data.

Weighted Mean – was used to compute the average value of sampling in replicates.

Respondents

The panel of evaluators of the sensory evaluation was chosen through purposive sampling. The respondents were composed of 30 members of which 8 of them were instructors of Food Service Management,4 of which are Food Technology major, 10 of which were technology faculty members who are non majors and 8 were composed of the students major in Food Service Management and represented the community as consumers. Orientation was given prior to sensory evaluation. They were chosen because they possessed the ability to discriminate and the willingness to participate in the evaluation process such as:

1. **Interest.** Found to be of major importance as a qualification is interest in evaluation of the work. There is much need for assurance that a selected judge is willing to participate in the evaluation of work.
2. **Health.** There may be instances when a person is both interested and available for panel testing work but health problems may not warrant his participation.
3. **Integrity.** Since evaluation requires personal judgment, integrity is utmost importance. Judges are expected to respond exactly what they honestly think or fell about the product under test. Any form of cheating may invalidate results.
4. **Attitude.** A person's attitude towards his work is an important criterion for success. It could be strongly related to development of interest and healthy work attitude which are good starting points for an efficient evaluation.
5. **Stability.** Sustained stability of panelists' responses in sensory evaluation is an important qualification. The term stability implies precision in responses. A judge with a high sensitivity to certain sensory qualities will have the ability to observed slightest differences between samples.

The following are Steps in the Preparation of Lubi-Lubi Noodles.

Blanching of the Lubi-lubi leaves- leaves should be blanch in a simmering temperature for 5 minutes to facilitate the ease extraction of puree and to remove some rodents in the leaves itself.

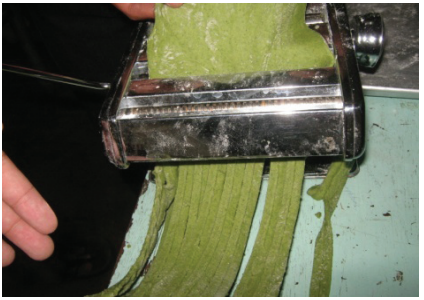
Osterizing- the process by which the leaves is made into puree.

Preparation of the ingredients- to facilitate the ease preparation of the noodles, needed ingredients be measured and prepared.

Mixing and kneading - Mixing of the wet and dry ingredients ensured maximum utilization of the raw material for the formation of the dough. Kneading on the other hand is an important step for gluten development since thorough dispersal of the ingredient gives it the opportunity to take up maximum amount of water resulting to enhance dough texture. After kneading the dough is allowed to rest for 15 minutes. It is now termed as

kneaded dough.

Sheeting - The dough passes repeatedly between rollers of the pasta maker which will be set at no. 7. Sheeting will be done until the dough will transformed to a smooth continuous sheet if desired thickness without any holes or breaks. This method requires the use of properly developed gluten to form a dough sheet with sufficient tensile strength and extensibility. Sheeting of the dough



Cutting - With the use of noodle maker, the sheet or dough will pass through the cutter, forming long, thin noodle strips. The noodle strips will be cut to about 12 inches long and carefully placed on trays to ensure that no clumping occurs. These will then be allowed to rest for 5 min.

Pre cooking of the noodles was done by immersing noodles in boiling water (100 C) for at least one minute to allow the amylase in the starch to swell or gelatinize. The noodles will be placed in a sieve to facilitate easy removal and to ensure that they are not

overcook and to prevent clumping together.

Drying was done by placing in a cauldron and dry in an oven at 70 C until the moisture content was constant. Drying prepares the noodles for frying.

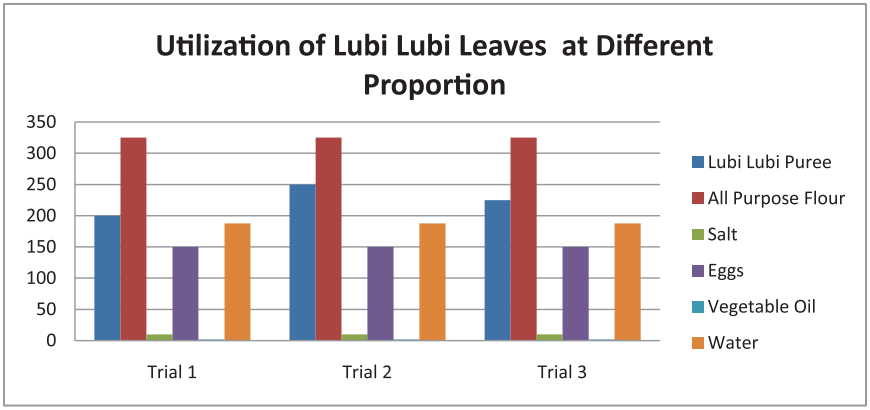
Frying this is one way of the fastest ways of removing moisture and fixing the shape of the noodles. Frying results to instant noodles that easily rehydrates and cooks within minutes in boiling water. Contact

with hot oil at a temperature of 160 C rapidly evaporates the water from the precooked noodles, forming a porous noodle.

Packed and Store.

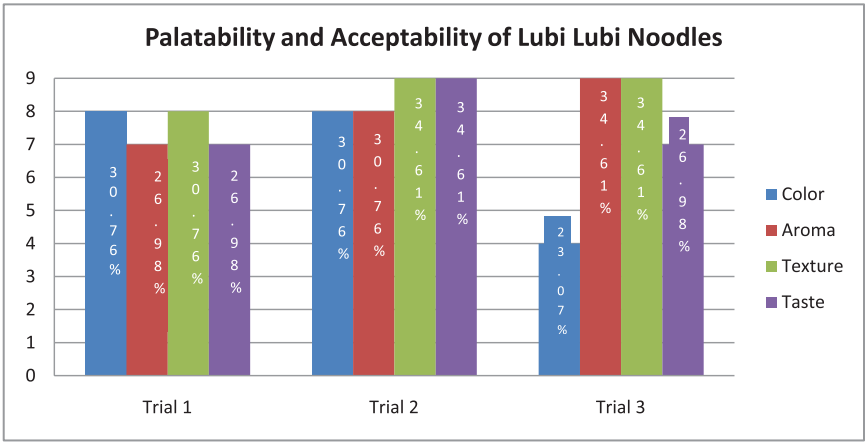
RESULTS AND DISCUSSION

Table 1. Utilization of Lubi- Lubi Leaves at different proportion



Gleaned from the table, are the different proportions of the developed noodles, utilizing the puree as its variable

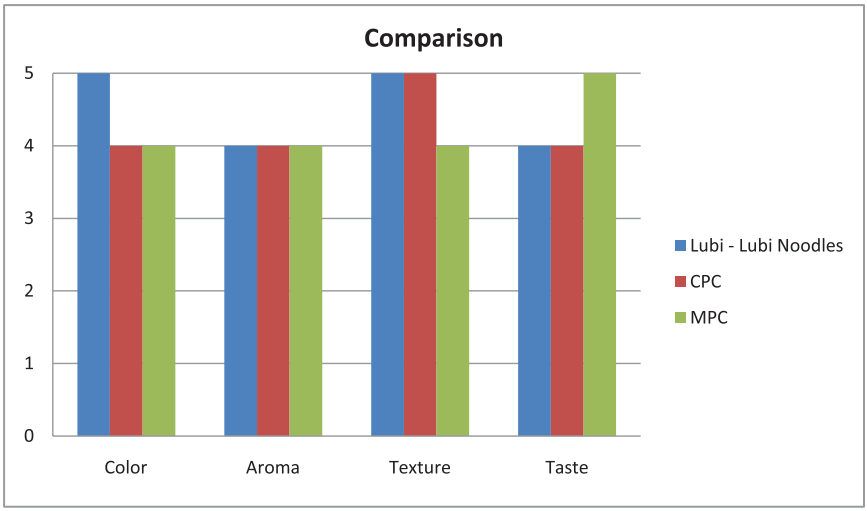
Table 2. Palatability and acceptability of Lubi-Lubi noodles



Results shows that among the different treatments conducted, treatment 2 is the one accepted with a corresponding perception of very much acceptable as to color, much acceptable as to aroma,

extremely much acceptable as to texture and extremely acceptable as to taste respectively. This is associated with the percentage of puree used and the freshness and maturity of the leaves used in the developed product.

Table 3. Comparison of characteristics



Results showed that developed lubi-lubi noodles can be comparable to other veggie noodles, considering the fact that the lubi-lubi plants are classified as indigenous material. Correct methods and technique in the preparation of noodle were highly observes and applied.

Experimental cookery was further conducted. Adjustments on the proportions of ingredients particularly the amount of lubi-lubi puree were used. Evaluations of the product by panelists were again conducted. Results showed the improve texture and color of the noodles. All replications were subjected to comments of evaluators composed of trained teachers.

CONCLUSIONS

Based on the findings of the study, the researchers concluded that lubi-lubi leaves are potential ingredient in the preparation of veggie

noodles. Sensory evaluation conducted shows that developed noodles were extremely acceptable. Noodles were comparable to other veggie noodle and considered as more nutritious.

The researchers support the findings that lubi-lubi leaves have high potential value. The academe and food manufacturing in the locality must work on the commercialization of the products.

RECOMMENDATIONS

It is highly recommended that the lubi-lubi noodle food product and standardized recipe be verified and pilot tested for commercialization. The proximate analysis of the developed enriched noodles in terms of moisture content, ash content, fiber content, protein content, fat content, carbohydrate content and shelf-life is highly recommended too, for the developed product to compete with the other commercial veggie noodles. Further research is still needed to address other gaps revealed by the research.

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