Wonton wrapper in sweet potato (*Ipomoea batatas*) and durum flour

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**ABSTRACT**

This study assessed the acceptability and effectiveness of sweet potato and durum flour based-wonton wrapper. An experimental design using descriptive and statistical treatment in processing of data with survey and questionnaires was employed to generate the data. Questionnaires were given to 10 experts and 30 students using purposive sampling. It was found out that the output is highly acceptable in terms of the sensory evaluations and a significant mean difference between the Standard Recipe and the Modified Recipe of the Wonton Wrapper. Based on the findings of the study, the output, in the experiment met the standards in its taste, texture, colour, acceptability and effectiveness. Improved recipe of the wonton wrapper can be enhanced to meet its desired quality, thus, engaging its results, may require other interested food experts to innovate similar products using the sweet potato and durum flour based-wonton wrapper.

**Keywords:** *Ipomoea batatas*, acceptability, effectiveness, siomai wrapper, nutrition status.

**INTRODUCTION**

Everyone in the community has the right to adequate food. Aside from human's health, good nutrition is important in the economic and social development within the country. Nutrition is the prime importance throughout a person's life. It is interrelated to many other basic needs. It is reflected not only for the physical state of an individual, but also in the personal attitudes towards life. One of the rich sources of nutrients is those from the family of root crops. The huge farming of plants to produce yields and provide products as potential resource for industries is a necessity. The state of the art of crop farming alters generally in its capacity ranging from largely managed limited plots to commercialized farms over thousands of acres.

The Philippines, primarily an agricultural country, with insular geographical location and ideal tropical climate is blessed with root crops such as cassava (tapioca), "camote" (sweet potato), "ubi" (yam), banana and "gabi" (taro). These root crops are known to be good sources of dietary fibre. The potential of root crops as an industry is bright in view of the favourable climatic and soil conditions. One of the most important crops in the country, Philippines, is the Sweet Potato (*Ipomoea batatas*) or locally known as "kamote". It is the sweetest tasting root vegetable dicotyledonous plant that belongs to the family *Convolvulaceae*. These products are abundant in most tropical countries, more especially in the Visayan region. Root crops utilization contributes toward the realization of the country's economic goals and gives solutions to poverty. One of the incomes - generating crops that Filipino farmers rely on is the sweet potato production. There are various products made from sweet potato being produce, one of which is the production of sweet potato flour.

To Giango (2004) "sweet potato has multifarious uses and it is not only grown as a food substitute to rice and corn, but also as a potential source of raw materials for industrial uses". People process sweet potato for snacks such as chips or animal feeds. Today's lifestyle has dramatically changed along the way from food production to food consumption. This shift is drifted by the demand of time. Time demands make people prefer instant foods...
available in food chains and other establishments, bringing little concern about the food's nutritional value. In effect, it increases more cases of malnutrition, which is on the major health problems in the Philippines today. According to the Merriam Webster Dictionary, "malnutrition is a condition where the quality of food is inadequate, resulting in deficiency of certain essential nutrients". Homemakers, for example, can improve a recipe for their families and must entice their children to eat nutritious foods like fish and vegetables. Rupinta (2004) also supports this reality, by saying, that these contain essential food nutrients needed by the body and that children do not like to eat nutritious foods, but are enticed by junk foods, therefore, mothers must be challenged to improve their menu for the family so that the needed nutrients of the individual members of the family are provided to maintain healthy living.

The inadequacy of the basic needs is relatively large in some segment of the population, especially in the rural areas. This gives indirect solution to the country's unemployment problems as well as, a way of creating income generating opportunities to raise the general standard of living and requires more equitable distribution of income. It is believed that one way to improve the quality of life among the Filipinos is an innovative recipe of wonton wrapper that can enhance the family's nutritional status, thus, this study is conducted.

This study is anchored on the Presidential Decree (PD) No. 491, acknowledged as the Philippine Nutrition Act of the Philippines, which constituted the National Nutrition Council (NCC) as the highest policy-making and coordinating body on nutrition. Studies indicate that pregnant women and lactating mothers, newborn babies and young kids are prone to malnutrition that leads to retardation of the intellectual and physical development and decreases resistance to diseases resulting in unnecessary loss of human lives. Thus, nutrition is one of the priorities by the government to be realized by all pillars of the government. The Department of Education (DepEd) provides solutions to this never-ending problem in the society through implementing orders and memoranda. These mandates recognize the importance of good nutrition and indirectly the improvement of learners' academic performance in school. It is considered to be a sound investment in education as it is associated with increased enrolment, improved attendance, better performance, repetition reduction and decreased dropout or truancy, one of which is the DepEd Order Number 37, Series of 2014 which is the implementation of the School-Based Feeding Program (SBFP), addressing the public school children who are under nutrition problem and with short term hunger. This implementation is in cooperation with some local government units and non-government organizations.

The program provides hot meals to children ensuring a standardized recipe using “malunggay” (*Moringa oleifera* Lam) and 20-day cycle menu utilizing locally produced and grown foods. To address the nutritional deficiencies, the recipients are assured of additional 300 calories per day. A diversity of vegetables from the garden produce can be added in the menu to escape fatigue. A logical solution for this matter is establishing of vegetable gardens in every public school with a purpose of having fresh sources of vegetables that can be allocated to students with lack of nutritional status. Food preparations can be handled by the school’s Parents, Teachers and Community Association (PTCA) on rotation basis with the support of the home economics teachers, who are to be the feeding teachers. Initiating the feeding program in school is also being utilized for an avenue for the development of health and nutrition values and behaviour among school children.

A Feeding Center is an area in the school, which is allotted for the production of healthy foods, for feeding the malnourished and underweight school children, as well as, providing planting materials for home gardens. But, these foods can be generated if the school has backyard garden known as *gulayan* *sapaaralan*, where it is planted with locally grown vegetables and fruits. The schools may coordinate with the local government units in collaboration with non-government organizations and other government agencies to conduct trainings to sustain family food safety and to improve the children's nutritional status in the long term. Inocian and Nuñez (2015) support this claim that success in vegetable gardening is an attribute of passion in a seamless element of stretched consciousness, not only for feeding purposes, but for sustainable development as well.

The Department of Education Memorandum number 191, series of 2013 adheres the health and nutrition center as funded by Gulayansa Paaralan Program (GPP), in partnership with the Department of Agriculture–Bureau of Plant Industry (DA-BPI), which addresses malnutrition and promotes vegetable production and consumption among school children. This program desires to develop production of foods that are rich in protein, carbohydrates, vitamin A, and iron bringing an input to school feeding. This program also promotes food security in schools and communities through self-help food production activities and values among learners and appreciation of agriculture as a life support system. Primarily, public elementary and secondary schools nationwide are encouraged to enjoin the implementation of the programs.

Malnutrition is largely deterrent in the economic growth, which in particular, affects the early childhood where inadequate nourishment becomes irreversible. The average Filipino diet may have any bulk to starve off hunger, but not enough nourishment. The average Filipino is undernourished for not eating the right food and the nutritional balance cannot sustain physical and mental efforts. Malnutrition is a common problem not only with the poor, but the rich as well. It is the condition where the quality of food is inadequate, resulting in deficiency of certain essential nutrients.

To Laurente (2013) Filipinos are not only encouraged on
their own nutrition, but also to expand it to the entire community. Today's children are tomorrow's citizen, as such their normal growth and development must be given great concern. In the study of Grant and Gardner (2003), adequate intake of food makes them healthy and an inadequate food makes them sickly. Therefore, better health and better life for better future depends on the kind of food they eat. To ensure good nutrition, one is expected to know how to prepare and eat food properly to maintain a good balance of diet. One way to promote this is the recognition of sweet potato, as a potential nutritious food. Sosinski et al. (2001) support that sweet potato plays various roles in human diets aside from being a staple crop worldwide especially to people who are into body conscious.

The United Nation's Food and Agriculture Organization (FAO, 2011) signifies that sweet potato (Ipomoea batatas (L) Lam) in the developed countries are also necessary. According to FAO (2011), sweet potato is top listed on the seven crops worldwide that produces more than 105 million metric tons of food products yearly. In other report, it is considered among the worlds' most important food crops (Sosinski et al., 2001). On a fresh-weight basic from the developing countries it ranks fifth with more than 133 million metric tons among other crops. In most cases during calamities like typhoons and heavy floods, sweet potato is being categorized as a substitute to rice as "food security" or "famine relief" wherein people utilized in fight against hunger. There are situations that sweet potato has been added to rice to maximize its availability.

The nutritional compositions that include carbohydrates, fibers, carotenes, thiamine, riboflavin, niacin, potassium, zinc, calcium, iron, vitamins A and C of sweet potatoes are very necessary for human needs. Sweet potato is enriched with dietary fiber which is good for people who are into diet as it provides 359 KJ energy and about 0.05 g per 100 g of the total lipid content. According to United States Department of Agriculture (2009), sweet potato is enriched with dietary fiber which is good for people who are into diet as it provides 359 KJ energy and about 0.05 g per 100 g of the total lipid content.

From the United States Department of Agriculture on Nutritional Data on Skip the Pie (USDA, 2010) aside from the fruit of the sweet potato, the tubers play an important function depending on its utilization. It has an unsaturated fat, rich source of dietary fiber, helpful in fighting against anti-aging as it contains anti-oxidants that will help look younger with a better looking skin. Other nutrients found in the tubers of the sweet potato are the beta carotene (8,509 µg) and vitamin A (14,187 IU). These values enable the sweet potato in garnering the highest in any root-vegetables category. The function of vitamin A in our body is to maintain the integrity of healthy mucus membranes and skin and it is a primary nutrient for a healthy vision. According to Szalay (2014), to prevent the prevalence of lung and oral cavity concerns fresh and natural vegetables should be taken into account. People nowadays should be observant in their eating habits specifically those with lower resistance. Plenty of foods are displayed on the market stand not knowing what the nutritional compositions of a certain food product are. Consumers should select and purchase wherein members of the family can be benefitted in its core functions. From the American Dietetic Association, sweet potato leaves are more nutritious than the tuber. Every part has its desired function to play depending on how it is being utilized by the body. Due to its various roles a sweet potato plays around the world, the nutritional quality must transform to meet the specific roles in human diet (American Dietetic Association, 2008).

In home baking, flour is the primary ingredient. It composes of many types desired for its specific purposes in baking with one goal in producing the best quality of a finished product. All purpose flour is the most widely used of all flours. It is considered to be the universal flour in producing bakery products. It contains 10 to 12% of the protein content which is universally used in almost all of the bakery stores and goods from breads, pastries, cakes and cookies. It can be substituted in cake flour and bread flour as there is no change in color, texture and taste in the baking quality.

Bread flour is known as first class, as it is milled from hard wheat. It contains 12 to 14% of the protein content which testifies that bread flour has the largest protein percentage common to breads and all yeast raised dough because of its high protein content. Cake flour is known sometimes as soft flour from special premium grade soft flour. It has 9 to 12% of the protein content and due to its low protein content produces a soft gelatin during its mixing process. Cake flour is common to bake products such as cakes and pastries.

Durum flour is another type of flour considered to be a by - product from semolina flour. It is derived from the Latin word which means "hard". From its derivation, it is labeled to be the hardest among the family of wheat. Durum flour contains higher protein content and gluten content than all purpose flour. This is commonly used for pasta and spaghetti and often used in bread making. Due to its high protein content, it requires in forming a glutinous web for rising bread or dough. From Whole Grain Council (2004) it differs from hard wheat flour, because this has a finer texture and lighter consistency. According to US Department of Agriculture (2010) the hardest of all wheat is durum.

According to Hsiung (2005), shumai, a traditional Chinese dumpling is served with fluffy and flowery shape on top. It is a steamed or fried dumpling that is originated from China, popularly known as siomai in the Philippines. The fillings of this may vary by region. The filling of the siomai can be a combination of meat or fish and vegetables. An excellent source of protein comes from fish and meat. It also contains varying amounts of iron, thiamine, riboflavin.
and niacin. A variety of meat products such as the heart and the kidney are also good sources of nutrients wherein one can get more of the protein. The bones constitute of vitamins that serves to strengthen the structural parts of the body's tissues. There are more than 50 nutrients required in the human health, providing a healthier lifestyle. Foods are grouped according to their similarity of nutritive value. It is divided into six classes such as proteins and amino acids, fats and fatty acids, carbohydrates and minerals and vitamins and water. Most food contains more than one nutrient and no single food contains all the nutrients needed by the body. All foods are good, but man needs a variety of foods.

Wontons are made of square wrapper from a dough skin made of flour, egg, water, and salt. The wonton wrapper is a by-product of starch which contains carbohydrates, fats and protein which provide heat and energy to the body. Energy is the power to do work. Energy yielding foods includes rice, corn, bread, root crops and baked product. Fat is a concentrated source of heat and it is the source of energy which the body stored in quantity of adipose. Adipose tissue under the skin serves as insulation against cold preventing the rapid loss of heat. Protein is the main constituent of muscle and bones.

**Objectives of the study**

This study aimed to assess the effectiveness of wonton wrapper using sweet potato (*I. batatas*) and durum flour. It sought to answer these objectives: (1) analyze the strength of the sweet potato flour and durum flour in wonton wrapper; (2) find out the effectiveness of the improved recipe as exposed to different cooking methods such as frying, boiling and steaming; (3) describe the level of acceptability of the improved recipe to various food preparations such as siomai, dumpling and spring roll.

**MATERIALS AND METHODS**

**Research design**

The study utilized the experimental design, using descriptive and statistical treatment in processing of data. This method is applied to find out the strength of the sweet potato flour and durum flour that produced a wonton wrapper with a better quality along with such aspect as taste, texture, colour, firmness and acceptability of the product to the public. The experiment covered a period of one month which started from February to March, 2015. This study consisted of the basic recipe of wonton wrapper using all-purpose flour, sweet potato flour and durum flour.

**Detailed procedure**

The systems Approach of Input–Process–Output was used in the general procedure in the experiment. The input box contained the four (4) treatment formulations of sweet potato flour (*I. batatas*) from all-purpose flour, sweet potato flour and durum flour in different levels. These entire recipe formulations were subjected to sensory evaluation for the acceptability level of the enhanced product. Analysis of Variance (ANOVA) was utilized to find out the output if the there were significant differences among the flour (4) levels of formulations subjected to various methods of cooking. To come up with the most acceptable output of the wonton wrapper, the outputs were subjected to two groups of evaluators namely, ten (10) trained TLE teachers and thirty (30) MAVED students represented as the consumer panelists. Analysis of Variance (ANOVA) was used to determine if there were significant differences among the varying levels of formulations of the improved recipe.

**The laboratory environment**

Specifically, this study focused on the Cebu Technological University-Main Campus located at M.J. Cuenco Avenue St., and R. Palma St., Cebu City. The experiments made by the researcher as well as, the testing and evaluation made by the respondents were performed in the Graduate School Food Laboratory. The latter is located at the third floor of the Graduate Schools’ classrooms. It is equipped with tools and equipment needed in performing the experiment. Like any other laboratory activity, wonton wrapper makes needs important for basic utensils to perform. It involved the following: measuring cup, measuring spoon, mixing bowls, sifter, wooden mixing spoon, rubber scraper, rolling pin and noodle/pasta maker.

Four (4) treatments were formulated with the different levels of sweet potato flour and durum flour. The basic ingredient used in the making of the wonton wrapper is the all purpose flour. Product innovation was applied to be able to create an innovative product coming from the available sources at the market stand. The following were the modified formulations. Treatment 0 was considered as the control composed of the following ingredients: (2 cup durum flour, ½ teaspoon salt, 1 piece egg yolk, ¾ cups water. The texture of it was very fine since the durum flour exhibits an attribute of being fine. Treatment 1 composed of the following ingredients: ¼ cup sweet potato flour, ¼ cup durum flour, 1 piece egg yolk, ¼ teaspoon salt, ¼ cup water, 1 teaspoon oil. The ratio was in the equilibrium to measure its strength. Treatment 2 had the following ingredients such as: ½ cup sweet potato flour, ¼ cup durum flour, 1 piece egg yolk, ¼ teaspoon salt, ¼ cup water and 1 teaspoon oil. The results showed that the dough was harder and it is not good in the making of wonton wrappers. Wonton wrappers are made thinly but with its effectiveness on the different method of cooking. Treatment 3 had the following ingredients: ¾ cup sweet
teaspoon salt, ¼ cup water and 1 teaspoon oil. This formulation was highly recommended according to the results presented. It showed that the higher the composition of the sweet potato flour the more very firm the dough becomes.

Allotted time preparation for the different formulations took about 40 to 1 h per treatment, as it depends on the strength of the dough before it can be made into wonton wrappers. The varying levels of the formulations were made through different methods of cooking such as boiling, frying and steaming. Since the wonton wrappers are delicate it needs to have a low temperature (0 to 100°C) for boiling; moderate temperature (5 to 230°C) during frying and gentle, low temperature (100°C) for steaming. A series of trials were made from the treatments as it was exposed to various food preparations such as: "siomai", spring roll and dumpling an innovated wonton wrapper can be made compatible. Food testing and evaluation was made after cooking. With the responses made from the respondents, the researcher was able to make a wonton wrapper of "siomai" acceptable in their appetite.

**Statistical analysis**

The data gathered from the results of the sensory evaluation as perceived from the panelists were treated statistically using Average Weighted Mean, in order to determine the mean scores from the formulations. Analysis of Variance (ANOVA) was used to determine the significant mean differences between each formulation subjected to P-value and F-critical value.

**RESULTS AND DISCUSSION**

In order to encourage students, as consumer panelists, in developing awareness for the basic tastes such as sweet, sour, salt and bitter, they are given test questionnaire for them to fill. Likewise, they were encouraged to discriminate between formulations.

**Results on taste**

Each of the panelists given is exposed to different concentrations to determine the taste intensity of the improved recipe. The treatment formulations for wonton wrapper is made through mixing all its ingredients (T₀ to T₃), which varies in only the amount of sweet potato flour + durum flour added to other ingredients are held constant. Figure 1 revealed the results of the descriptive test of the respondents on taste; Treatment 3; ¾ C sweet potato flour and ½ C durum flour had the highest weighted mean of 8.73 with verbal description of "like very much" from the panelists. This was followed by T₀, T₂ and T₁ with the weighted mean of 8.07, 7.97 and 7.93 respectively. It revealed that the T₃ formulation was approved by the panelists considering the levels of concentration per ingredients. It increased their interest in eating and the quality of food. It implied that respondents appreciated
more of the nutritive value of the product. Based on the Shepherd’s Model of Frewer and Risvik (2001) what we choose to eat is based upon on three main factors: (1) the food itself and its nutrient content regulate hunger; (2) the person and his sensory perception of the food in combination with personality, previous experiences and mood etc and (3) economic and social factors such as choice, brand and attitudes toward other health factors. To Verbeke (2006) people are more concerned in terms of food quality considering its nutrition, food safety and environmental issues that will determine the acceptability of any food product.

**Results on texture**

As displayed in the Figure 2, the results of the descriptive test as perceived by the panelists on texture revealed that \( T_0, T_1 \) and \( T_3 \) formulation had a mean score of 8.07, 8.77 and 8.67 respectively, described as they “like very much”; \( T_2 \), with ¾ C durum flour and ½ C sweet potato flour having a mean score of 7.57 showed moderate rating. The nutritional content of sweet potato flour (\( I. \) batatas) and durum flour aid in the texture of the improved recipe. Durum flour is considered as the hard flour, which contributed a portion of the improved recipe to have a smooth texture. With the appearance of the food product made of durum and sweet potato flour, it produced a light and fine texture; this was subjected to different cooking methods to test the fineness of the product.

Texture is one of the characteristics that determine the quality of the improved recipe for wonton wrapper and it affects its appearance, mouth feel, and overall acceptability. Because of this, it leads to consumer rejection. The changes of the improved recipe from the different varying levels of the formulations may be due to the variations of the composition, as well as, changes in the different cooking procedure. Imitative tests like biting and chewing from the mouth are assessed by humans through sensory properties. Thus, Rosenthal (2010) asserts that imitative tests should have the most consistent parameters, for example, hardness, springiness and chewiness, etc. Thus, the more sweet potato flour is incorporated into the wonton wrapper the better the texture of the product result.

**Results on color**

The different formulations can be deceiving as it can denote ripeness and strength of dilution. As to how the panelists’ choices are combined, as regards to the food in the plate, it contributes or attracts its appeal. The exposure to different cooking methods such as: frying, boiling and steaming measure the color of the improved recipe, utilizing the sweet potato flour (\( I. \) batatas) and durum flour. The color of the treated samples is measured in terms of the panelists’ approval, as regards to the likeness of the varying levels of the formulations. In Figure 3, color shows treatments 1 and 2, which are the lowest among any of the treated formulations, which indicated 7.57 and 7.70 weighted mean respectively. \( T_0 \) and \( T_3 \) obtain 8.37 and 8.27 weighted mean. These findings imply that the use of bigger size of eggs improves the color of the product.

Heat treatment was applied as the improved recipe was subjected to varying methods of cooking to acquire the shelf - life of the food. The advantages of heat processing affects the color of the improved recipe which contains the following factors; simple control processing conditions, production of shelf stable products that need no refrigeration, the destruction of anti - nutritional factors and the enhancing of the available nutrients needed for the
human consumption (Fellows, 2000). Product development can be utilized using the four methods in heat process which includes the following: usage of the hot air, examples for this process is dehydration, baking and frosting (Ahmed et al., 2010); the usage of water or steam, examples for this process are blanching and pasteurization (Fernando et al., 2011); the usage of hot oils, examples for this is frying (Troncoso et al., 2009) and the usage of radiation as direct energy, examples for this are ohmic heating di-electric heating and infrared heating ((Zhong and Lima, 2003; Brennan and Samyue, 2004).

Results on firmness

Figure 4 reveals that the mean scores of T₀, T₁ and T₂ formulations have acquired a verbal description of “like moderately” obtain 7.87, 7.57 and 7.60. The T₃’s mean score of 8.50 has the descriptive rating of “like very much”. The results revealed that the varying levels of sweet potato and durum flour affect the firmness of the product. The varying levels of the formulations are exposed to different food preparations such as spring roll, dumpling and siomai. As to firmness, the panelists approved Treatment 3 with a composition of ¾ C sweet potato flour and durum flour. The improved recipe with different methods of cooking is tested through frying, boiling and steaming, thus, its firmness is proven tested.

Based on AACC Standard Method 74–09 in the study of Brennan and Samyue (2004), the bending and the snapping test is one of the methods in performing fracture and hardness test. The bending and the snapping test involve a sample of food, usually in a bar, resting on bottom support ring while a compressing probe move
down the center of the supporting ring, pressing the food until it snaps. The compression test is another method that could be used to test the hardness, while allowing cylinder probe moving down the center of a heavy platform to press the food, 20% of the food thickness allows measurement of the bread’s firmness. As stated by Kamolwan et al. (2003), most of the attempts actually measure textural quality, the character of which is a complex combination of several attributes such as firmness and smoothness.

**Results on acceptability**

Acceptability is determined on the basis of quality of scores obtained from the results of taste, color, texture and firmness of the improved recipe of the wonton wrapper. As displayed in Figure 5, the results of the descriptive test as perceived from the panelists on its acceptability reveals that T₀, T₂, and T₃ formulation indicate a mean score of 8.1, 8.1 and 8.7 respectively, which describes as “like very much”; T₂, with ¾ C durum flour and ½ C sweet potato flour obtaining a mean score of 7.7, which indicate a “like moderately” rating. Based on the findings from the respondents they have a different perception of the product as to the varying levels of sweet potato and durum flour.

All of the treatments are mostly acceptable treatment in terms of taste, texture, colour, firmness and acceptability with the description of like very much as perceived by forty (40) consumers as food product evaluator. However, as perceived by the panelists on the level of acceptability of treatment formulations, Treatment 3 is the most acceptable treatment in terms of taste, texture, colour, firmness and acceptability with a verbal description of like very much. Treatment 3 is also tested for its effectiveness in various food preparations such as “siomai”, dumpling and spring roll, which are concentrated with verbal description of very effective (Figure 7).

One of the objectives of the study is to find its acceptability and effectiveness of the improved recipe that is allocated to the needs of the human perceptions (Costell
et al., 2000). With the improved recipe it can be displayed on the market stand wherein consumers can grasp more of the nutrients than allocating food products that has less in nutrients. They should be optimistic in terms of handling and selecting food products so that minor illness will be prevented.

Based on the data gathered from the panelists, it is found out that the $T_3$ formulation with $\frac{3}{4}$ C sweet potato flour and $\frac{1}{2}$ C durum flour compositions transcends its acceptability from the different sensory attributes (Figure 6).

**Results on effectiveness**

Any individual that accepts or rejects food is a multi-dimensional nature. Panelists’ answers to food are not only ignoble in the sensory attributes of the product and the physiological status, but these are tested on its effectiveness. As presented in the Figures 7 and 8, Treatment 3 showcases its effectiveness to various food preparations such as *siomai*, dumpling and spring roll. Based on the results presented in Figure 7, the $T_3$ formulation is capable of the “*siomai*” wrapper with the weighted mean of 3.55 with the “very effective” rating. On the other hand, dumpling and spring roll indicate a weighted mean of 3.02 and 3.25 with the rating of “effective” respectively. These three food preparations of steaming boiling and frying, using $T_3$ formulation, show effective results. During the frying procedure, the formulation $T_3$ indicates some cracks on its wrapper. It implies that frying is not suited to the improved recipe. During the boiling and steaming procedure, the improved recipe produces a good quality textured wonton wrappers with its inside fillings. Figure 8 shows that the method of boiling and steaming in $T_3$ formulation can be more

**Figure 7:** Treatment 3 exposed to various food preparations.

**Figure 8:** Treatment 3, exposed to different methods of cooking.
adaptable than the frying method.

Conclusion

Wonton Wrapper can venture the rising demand of food preparations in the market stand. This product demands less cost, but with high nutritional value compared to the existing wonton wrappers in the market. This experimental study is practical in a way that products used are available in the market for food preparation and development considering the health benefits of sweet potato and durum flour.

RECOMMENDATION

Based on the findings and conclusion, food industries may use wonton wrapper in Sweet Potato (I. batatas) and Durum Flour be adopted using the T3 with its composition of 3/4 sweet potato flour and 1/2 durum flour in one of their recipes. Another similar replication of the study can be conducted using another media.

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