ACCEPTABILITY OF WINGED BEAN CHIPS

Presented To

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**Acceptability of Winged Bean Chips**

**Background and Rationale of the Study**

The winged bean (Psophocarpus tetragonolobus), also known as cigarillas, goa bean, four-angled bean, four-cornered bean, manila bean, princess bean, asparagus pea, dragon bean, is a tropical herbaceous legume plant. Winged bean is widely recognized by farmers and consumers in South Asia for its variety of uses and disease resistance. Winged bean is nutrient-rich and all parts of the plant are edible. The leaves can be eaten like spinach, flowers can be used in salads, tubers can be eaten raw or cooked, and seeds can be used in similar ways as the soybean. The winged bean is an underutilized species but has the potential to become a major multi-use food crop in the tropics of Asia, Africa, and Latin America.

A chip (American English and Australian English) or crisp (British English) is a snack food in the form of a crisp, flat or slightly bowl shaped, bite-sized unit. Some chips can be made into dishes and served as an appetizer, side, hors d'oeuvre, etc. Some types of chip are often served in the combination plate, chips and dip. Other chips are sweet or strongly flavored or fragile. Tortilla chips can be used for chips and salsa, nachos, bean dip, guacamole, or a layered dip containing multiple of these.

**General Objectives of the Study**

This study aims to find out if Winged Bean Chips will be accepted by the residents of Barangay Cubay Napultan Sibalom,, Antique and if this product will have benefits to the Barangay.

1. Determine the acceptability level of Winged Bean Chips in terms of a) 50% Winged Bean, 35% flour, 5% egg, 5% salt and 5% pepper b) 60% Winged Bean, 25% flour, 5% egg, 5% salt and 5% pepper. As to its aroma, taste and texture
2. Determine the profile of all respondents in terms of sex and gender
3. Determine if there will be big difference in terms of a) 50% Winged Bean, 35% flour, 5% egg, 5% salt and 5% pepper b) 60% Winged Bean, 25% flour, 5% egg, 5% salt and 5% pepper.

**Conceptual Framework:**

This is the conceptual framework of the study, The antecedent variable contains the profile of the respondents in terms of age and sex. While the interdependent variable contains the different mixing percentage and the dependent variable contains the acceptability level of Winged Bean Chip in terms of its texture, taste and appearance.

Acceptability level of Winged Bean Chips in terms of its:

• Texture

• Apperance

• Taste

Winged Bean Chips Mixing Percentage

Respondent’s Personal Information

•Sex

-Male

-Female

•Age

**Definition of Terms**

For the purpose of clarification, the important terms used in this study have been defined operationally. The following terms are;

**Winged Bean** refers to the main ingredients of apple jelly

**Acceptability.** refers to determining how well an intervention will be received by the targetpopulation and the extent to which the new intervention or its components might meet the needs of the target population and organizational setting.

**Texture.** refers to the smoothness of Apply Jelly.

**Taste.** refers the sensation of flavor perceived in the mouth and throat on contact with a substance.

**Aroma.** a distinctive, pervasive, and usually pleasant or savory smell**.**

**Age.** refers to the respondents who evaluate the propose study**.**

**Sex.** this is a respondent within male/female who evaluate the propose study**.**

**Significance of the study:**

The result of this experiment will provide some information of Apple Jelly

This study is significant to the following:

Entrepreneur This experiment might convince or help them to create their own product.

Residents of the said Barangay this experiment will benefit the residents in order of the nutrition that can apple and coconut milk give.

Costumers/Consumers as said above people eating apple and coconut milk can gain nutrition from it.

Future Researchers this study can help future researchers if they are into knowing the acceptability level of product in the market especially in similar types of product.

**Scope and Limitation**

The proposed study was concentrated only on the acceptability of Winged Bean Chips. It depends upon the response of the selected residents of the Sibalom, Antique specifically Barangay Cubay Napultan and Barangay Villahermosa.

**CHAPTER 2**

**Review of Related Literature**

This chapter presents the related literature both from local and foreign sources.

This chapter includes the ideas, finished thesis, generalization or conclusions and others. Those that were included in this chapter helps in familiarizing information that are relevant and similar to the present study.

**Related Literature**

According to William L. Kerr (2012) Low-fat tortilla chips and sweet potato chips were developed by a continuous vacuum belt drying (CVD) method and compared to those made by deep fat frying (DFF). Quality factors of the products were investigated including oil content, texture attributes, color, sensory properties, shrinkage and nutrient retention. Drying characteristics such as drying time, diffusivity, and drying models were studied in this research. A continuous vacuum drying method was used to develop low-fat tortilla chips and sweet potato chips with good sensory properties. The CVD chips developed an expanded structure and contained 1.57-1.82 g oil/100 g, depending on initial thickness, compared to 33.37- 34.80 g oil/100g for DFF chips. Three levels of chip thickness and three levels of plate heating temperature were studied to show how the drying conditions affected the quality of tortilla chips and the amount of energy consumed. Several drying models were investigated to test their applicability to CVD tortilla chips. The models can be used to predict drying times and optimize drying processes, and provide insight into the mechanisms of drying and the importance of product properties. Model was developed from the drying rate curves that incorporated a characteristic drying coefficient [k(t)] that varied with time. All models had good agreement between experimental data and predicted data, with r2>0.98. With consideration of other goodness-of-fit indicators (SSE and χ2), results showed that the model that incorporated k(t) gave the best fit. The color, texture, microstructure, and β-carotene content of CVD sweet potato chips were studied and compared to DFF chips. The results showed that continuous vacuum belt drying gives good color and nutrient retention in the sweet potato chips, and that CVD chips had similar texture attributes to those prepared by deep fat frying. Low temperature (100°C) vacuum dried products had the most similar color values (L\* C\* H\*) to fresh sweet potatoes. Chips dried at a sequence of temperatures (T-mix=140/120/100°C) had the lowest hardness and highest factorability, and were most similar to DFF chips.

According to Alberto Stefano Tanzi (2019) Winged bean is popularly known as “One Species Supermarket” for its nutrient-dense green pods, immature seeds, tubers, leaves, and mature seeds. This underutilised crop has potential beneficial traits related to its biological nitrogen-fixation to support low-input farming. Drawing from past knowledge, and based on current technologies, we propose a roadmap for research and development of winged bean for sustainable food systems.

Reliance on a handful of “major” crops has led to decreased diversity in crop species, agricultural systems and human diets. To reverse this trend, we need to encourage the greater use of minor, “orphan”, underutilized species. These could contribute to an increase in crop diversity within agricultural systems, to improve human diets, and to support more sustainable and resilient food production systems. Among these underutilized species, winged bean (Psophocarpus tetragonolobus) has long been proposed as a crop for expanded use particularly in the humid tropics. It is an herbaceous perennial legume of equatorial environments and has been identified as a rich source of protein, with most parts of the plant being edible when appropriately prepared. However, to date, limited progress in structured improvement programmes has restricted the expansion of winged bean beyond its traditional confines. In this paper, we discuss the reasons for this and recommend approaches for better use of its genetic resources and related Psophocarpus species in developing improved varieties. We review studies on the growth, phenology, nodulation and nitrogen-fixation activity, breeding programmes, and molecular analyses. We then discuss prospects for the crop based on the greater understanding that these studies have provided and considering modern plant-breeding technologies and approaches. We propose a more targeted and structured research approach to fulfil the potential of winged bean to contribute to food security.

According to [M.Singh](https://www.sciencedirect.com/science/article/pii/S0254629918315758?fbclid=IwAR2o_N5ZmtMVybN4SLWA-mDFZNpV1izISWszBaUwqWMCMqycJpYm3Uy8EQ4#!) (2019) Winged bean being a minor pulse crop has been less focused for research purposes. However, seeing at its enormous potential as a nutrient-rich crop, a study was conducted at ICAR-IIVR, Varanasi to encourage this underutilized legume crop. Nineteen winged bean genotypes were evaluated for their antioxidant potentiality and phenol and [flavonoids](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/flavonoid) content. Two chemo metric techniques (PCA and AHC) were implied to find out the pattern of variation available for antioxidant potentiality as well as to find out the best performing genotypes. The phenol content ranged from 48.4 to 143.5 (maximum in AMBIKA-II-I) mg GAE/100 g FW, and total flavonoids content ranged from 9.1 to 37.0 mg CE/100G FW (maximum in MWBS-16-26). In both DPPH and [TEAC](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/trolox-equivalent-antioxidant-capacity) assay, hydrophilic [antioxidant activity](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/antioxidant-activity) was towards higher side in AMBIKA-13-4 B (5.02 μmol TE/g FW and 3.06 μmol TE/g FW respectively). The genotypes AMBIKAWB-II-I, AMBIKA-13-4 B and MWBS-16-26 were identified superior based on their overall total phenolic, total flavonoids and antioxidant activities coupled with chemo metric analysis.

According to [Shai Cohen](https://blendofbites.com/about-us/) (September 20, 2021) There are Health Benefits of Winged Beans

Health Benefits of Winged Beans

1. **Enhances immunity and supports weight loss**

This legume is full of vitamin C and vitamin A, both of which are known to nourish the immune system providing it with more strength to combat diseases. It assists your body in preventing possible infections and illnesses. The vitamin C content is responsible for acting as a protective force in keeping harmful substances at bay that could cause the body to break down. Vitamin C is known as a strong water-soluble antioxidant, and when employed in diets helps build elasticity of vessels and can inhibit cancer. These sigarilyas health benefits build immunity using vitamins A and C along with some B complex vitamins, and about a hundred grams of winged bean can provide up to 31% of vitamin C for the body. Winged beans have very low amounts of calories; this, along with their fiber content helps create necessary fullness that can lead to weight loss.

1. **Improves eye health and energy levels**

One of the benefits of sigarilyas is that it can aid in the relief of eye problems. Research has shown that thiamine deficiency in humans can lead to damaged eyesight. The thiamine in the winged bean can aid the prevention of health problems that concerns vision. The continuous intake of this legume can assist in mitigating some eye problems like glaucoma and cataracts. Thiamine fosters the growth and healing of muscles and nerves in the eye that is in charge of sending signals to the brain. This legume boosts energy levels employing the nutrients packed in it such as phosphorus and sugars like lactose and fructose. Phosphorus improves energy levels by eliminating the regular occurrence of fatigue, restlessness, muscle weakness, and overall numbness of the body due to stress. The various sugars contained in this spectacular treasure trove of nutrients directly enter the bloodstream after processing. It replenishes your energy levels and sustains them while preventing quick dissipation. This legume is also known for its italic acid content and should not be readily consumed by individuals with, or prone to kidney stones.

1. **Improves digestion and bone health**

This legume contains fiber and is very rich in calcium. As mentioned earlier, the fiber content in the winged bean is not only good for preventing weight gain but also helps in fostering stomach bacteria and aiding digestion. It prevents the process of constipation and stomach imbalance. The fiber in this legume does this by removing excess waste from the stomach which prevents bloating and gas. Fiber provides this rich full filling and it gives the stomach a good digestion process. The calcium in sigarilyas comes with its benefits to the human body. Like fiber, it is abundant in this legume. Calcium is an important nutrient as it supports the strengthening of bones, teeth and is integral for bone growth and healing. The high percentage of calcium reduces the risk of osteoporosis and other bone-related issues in the future. This legume has the highest calcium content amongst all others. It brings about healthy teeth and fingernails while improving the whole bone network of the human body. The calcium present in the winged beans also helps in the creation and monitoring of the bones while providing the strength to surmount diseases. This legume comes with other nutrients like protein that helps in bodybuilding and tissue repair and also vitamins A and C which work in tandem to ensure the body remains healthy.

1. **Beneficial during pregnancy**

Winged beans possess good amounts of folic acid which are very essential for mothers during pregnancy. It facilitates healthy child development, as well as aiding in the delivery process. The folate also works to prevent the progression of any tube defects to the unborn child. The iron content in the winged bean also contributes to childbirth by reducing the chances of maternal loss of blood and low birth weight. Also, the large amounts of manganese in this legume reduces the inflammatory response and prevents swelling before or after the delivery. The antioxidant capacity of this legume also contributes to reducing or relieving signs of swelling and sprains. This is especially advantageous to people with arthritis conditions by treating the deficiency of dismutase in the body. All these benefits make this versatile legume a worthy addition to your diet as a pregnant mother.

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1. **Prevents diabetes, premature aging and treats nutrient deficiency**

Calcium and vitamins like vitamin D work together to reduce the risk of diabetes, by the process of maintaining the process of glucose breakdown in the body. The calcium and vitamins engage the pancreatic cells, making them optimize the production and distribution of insulin to better help regulate the blood sugar levels in the body. This process balances the sugar content of your blood thereby preventing diabetic conditions in the body. The antioxidants in this legume help mitigate the attack on cells by free radicals that are harmful to the body. Vitamins C and A content in the sigarilyas prevent the onset of premature aging and eliminate wrinkling in the skin. It also prevents spots and blemishes on the skin caused by aging processes. Lastly, due to the high nutrient content of this legume, its regular intake provides a steady source of sufficient nutrients in the body. It is filled with nutrients like phosphorus, iron, calcium, copper, magnesium, and many others that contribute to its overall nutrient yield

**Texture**

According to J. Chen, A. Rosenthal (2015) Food texture is a collective term of sensory experiences originated from visual, audio and tactile stimuli. The sensation of food texture plays a crucial role in influencing consumers’ liking and preference of a food product. Consumer concern and interest of food texture vary from one type of food to another. For solid foods, sensory experience associated with fracture and breaking could be the most relevant textural features, whereas the sensation of flow behavior could be the most critical texture-related feature for fluid foods. For semisolid or soft solid foods, different patterns of stress–strain deformation provide key information for the delicate texture variation among this type of food. According on the statement above texture have a crucial role in influencing consumers because texture can affect our enjoyment of such food,

**Taste**

According to Bryn Farnsworth, Ph.D (April 5 2022) Taste is the result of substances landing on the receptors of the tongue which activate receptor signalling. One of the breakthrough moments for the science of flavor was the discovery of the five different basic taste receptors [8] – sweet, sour, bitter, salt, umami (umami is also often referred to as “savory”). Recently there has also been research suggesting additional receptors, for the taste of water, and for the flavor of fat

The statement above is related to our study in the sense of it stated there that we need taste in order to identify if the product is good or bad.

**CHAPTER 3**

**Research Design**

Quantitative Experimental research design is used to determine the level of acceptability of Winged Bean Chips. Among the residents that are selected from Barangay Cubay Napultan Sibalom, Antique, In this study the researchers will conduct an experiment and will provide a questionnaires to determine its acceptability.

**Study Population and Sampling**

Will conduct a survey on the Barangay Cubay Napultan Sibalom, Antique. And Villahermosa Sibalom, Antique There will be 60 respondents 30 for Barangay Cubay Napultan and 30 for Barangay Villahermosa.

**Sampling Technique**

Non-probability sampling will be used within the selected Barangays in Sibalom, Antique. Specifically Barangay Cubay Napultan and Barangay Villahermosa. This study’s purpose is to determine the acceptability of Winged Bean Chips. To provide support on the study, the researchers conduct a survey on the respondents.

**INSTRUMENTATION**

This study used a questionnaire designated for the respondents. The questionnaire consists of two parts for the researchers to gather the following information. Part 1 personal information of the respondents and Part 2 will be the level of acceptability of Winged Bean Chips.

The following is use as guide for the respondents in answering the questionnaire for, Taste, Texture and Appearance.

**Scale Description**

5 Very Acceptable

4 Acceptable

3 Moderately Acceptable

2 Less Acceptable

1 Not Acceptable