

## **BIBLIOGRAPHY**

BALANGEN, DEO F. APRIL 2008. A Sensory Evaluation on the New Innovated Carrot Patty, A Vegetable Based Product. Benguet State University, La Trinidad, Benguet.

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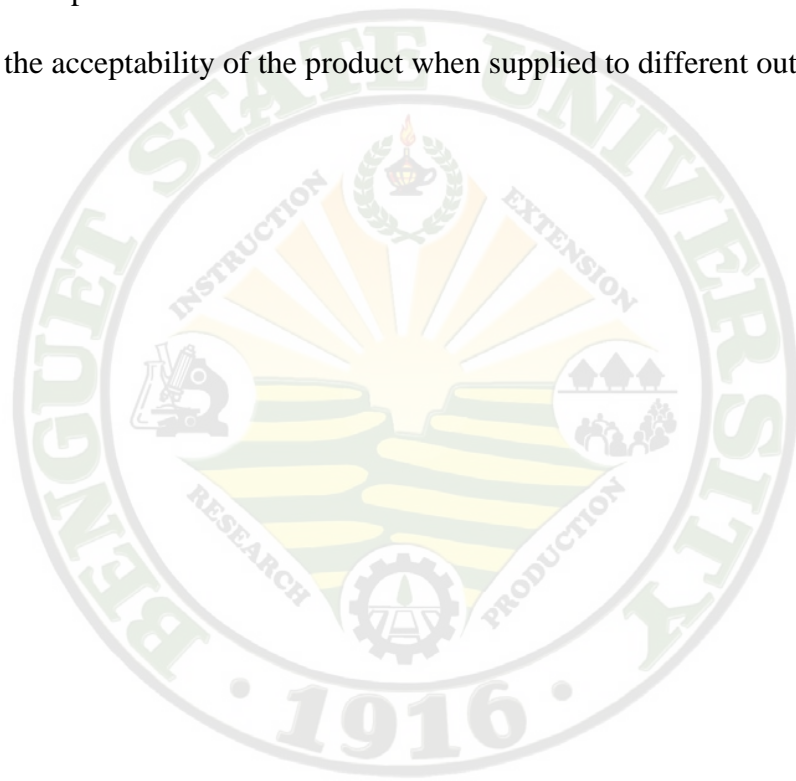
## **ABSTRACT**

This study is an evaluation of a new carrot burger product introduced by the researcher and it aimed to find out the level and factors affecting the acceptability of consumers. The study also aimed to find out the potential consumers.

The study was conducted on February 2008 and two samples were introduced namely: Carrot Burger 101 and Carrot Burger 102, which was compared and evaluated. Sensory evaluation/ taste-test was used in the product evaluation, and it was set-up at the Department of Agricultural Economics and Agribusiness Management. Evaluation forms were distributed to the panelist and they were briefed and instructed before proceeding to the sensory test. Data gathered were tabulated and analyze using the T-test, and presented using mean, percentage and frequency counts.

A total of 50 students' cook/chef, burger lovers, and teachers were the evaluators/taste panelist of the product. Out of the 50 panelists, 32 were females and most of them were from age bracket 14-20 years old. As to employment, 29 were unemployed, usually college student and single.

Results of the study showed that Carrot Burger products were accepted based on the evaluators/taste-panelist response/rating. In terms of acceptability of color, texture, taste, packaging, appearance and aroma the two Carrot Burgers were not significantly different but in terms of the general acceptability, the difference of Carrot Burger 101 and Carrot burger 102 were highly significant. This shows that Carrot Burger 102 is more accepted. It is therefore recommended to improve the product based on the suggestions and comments of panelist. It is further recommended that further research be conducted to determine the acceptability of the product when supplied to different outlets given a set of price.



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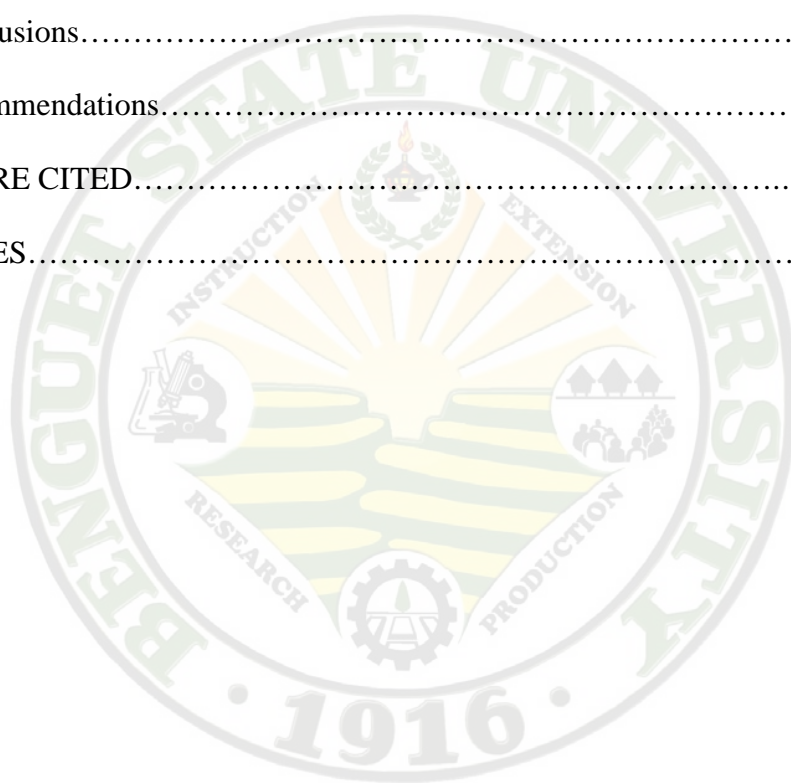
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## INTRODUCTION

### Rationale

Nowadays, food is still the most viable business enterprise because it is one of the basic needs in order to live. Thus, many food companies are flooding the market of innovated products. At present, entrepreneurs are into product development through innovation or imitation. The reason for product innovation is to come up with a product that is close to an existing product with very high market demand.

In today's generation, customers are very keen, they are choosy and most of all they are now health conscious. Consumers nowadays, choose food products that are safe, nutritious and clean food and good for the health. Thus coming up with this carrot patty an innovation of the commercial patties used in burger stands like Big Mac, fast foods like Jollibee, McDonald, and Greenwich and so on which is usually made of flour, meat and fish resulting to high price. The innovations of this product were reduction of additives used and utilizes carrots rather than meat. Carrots are one of the major crops grown in the Cordillera specifically in cooler parts of Benguet and Mountain Province.

This vegetable crop contains many nutrients like calcium, phosphorus, iron, sodium, potassium vitamin C, B, and large amount of vitamin A which is also known as the beta-carotene giving its orange color. This is also used as medicines for heart attacks, hangovers and also for skin diseases, impurities, acne eritema appearance of wrinkles, and difficulty in tanning. Nonetheless, carrot is very common as vegetable salad and is eaten raw or cooked; it can also be used as savory dishes. At present it is well known for its' juice healing products.



### Statement of the Problem

The study seeked to answer the following questions?

1. What is the profile of the respondents/judges/taste panelists?
2. Who are the consumers or potential consumers of the carrot patty products based on the evaluator's profile?
3. What is the level of acceptability of consumers on carrot patty products?

In terms of:

- a. Color
  - b. Texture
  - c. Appearance
  - d. Shape
  - e. Aroma
  - f. Taste
  - g. Packaging
  - h. Acceptability
4. What are the criteria/ factors affecting the acceptability of carrot patty?

### Objectives of the Study

The study aimed to:

1. Identify the consumers or potentials consumers of carrot patty products based on the taste panel's profile.
2. Know the level of acceptability of consumers on carrot patty as to the color, texture, appearance, shape, aroma, taste, packaging, general acceptability.



3. To know the factors affecting the acceptability of carrot patty.

#### Importance of the Study

At present the government is promoting entrepreneurship in order to reduce the problem of unemployment in the locality, through entrepreneurship, a new product is developed, a new market is established, additional tax is paid to the government increasing government income. The result of this study will provide information to those entrepreneurs and aspiring entrepreneurs who are aspiring to introduce nutritious, delicious and safe food products like carrot patty. The acceptability of this product will be a guide in the decision of investing in carrot patty or other similar vegetable based patty. The results will also serve as reference for future similar research.

#### Scope and Limitation of the Study

This study is concerned on the acceptability of the consumers of this innovated product. The study will also find if the product could be sold in the market.





## REVIEW OF LITERATURE

### History of Carrot

The Carrot originated some 5000 years ago in Middle Asia around Afghanistan, and slowly spread into the Mediterranean area. The first carrots were white, purple, red, yellow/green and black - not orange. Its roots were thin and turnip shaped. Temple drawings from Egypt in 2000 B.C. show a plant, which some Egyptologists believe to represent a large carrot. Egyptian papyruses contain information about treatment with carrot and its seeds were found in pharaoh crypts. Carrot seeds have been found in prehistoric Swiss lake dwellings in Ronbenhausen giving clear evidence of human consumption. There is however no evidence of cultivation at this stage, more likely they were used for medicinal purposes. Similar findings appear also in ancient Glastonbury. Neolithic people savored the roots of the wild carrot for its sweet, succulent flavor.

The name Carota for the garden Carrot is found first in the writings of Athenaeus (A.D. 200), and in the book on cookery by Apicius Czclius. It was Galen the Greek physician (second century A.D.) who named the wild carrot *Daucus pastinaca* (adding the name *Daucus*) to distinguish the Carrot from the Parsnip, though confusion remained steadfast until botanist Linnaeus set the record straight in the 18th century with his system of plant classification. The scientific name he gave the carrot is *Daucus carota*, the parsnip *Pastinaca sativa* (Anonymous, 2007).

The carrot (*Daucus carota* subsp. *sativus*) is a root vegetable, usually orange or white, or pink in color, with a crisp texture when fresh. The edible part of it is the taproot. It is a domesticated form of the wild carrot *Daucus carota*, native to Europe and



southwestern Asia. It has been bred for its greatly enlarged and more palatable, less woody-textured edible taproot, but is still the same species.

It is a biennial plant which grows a rosette of leaves in the spring and summer, while building up the stout taproot, which stores large amounts of sugars for the plant to flower in the second year. The flowering stem grows to about 1 m tall, with an umbel of white flowers (Wikipedia, 2007).

### Nutritional Contents of Carrots

Carrots are nutritional heroes; they store a goldmine of nutrients. No other vegetable or fruit contains as much carotene as carrots, which the body converts to vitamin A. This is a truly versatile vegetable and an excellent source of vitamins B and C as well as calcium pectate, an extraordinary pectin fiber that has been found to have cholesterol-lowering properties. The carrot is a herbaceous plant containing about 87% water, rich in mineral salts and vitamins (B, C, D, and E).

Raw carrots are an excellent source of vitamin A and potassium; they contain vitamin C, vitamin B6, thiamine, folic acid, and magnesium. Cooked carrots are an excellent source of vitamin A, a good source of potassium, and contain vitamin B6, copper, folic acid, and magnesium. The high level of beta-carotene is very important and gives carrots their distinctive orange color.

Carrots also contain, in smaller amounts, essential oils, carbohydrates and nitrogenous composites. They are well known for their sweetening, anti anemic, healing, diuretic, remineralizing and sedative properties. In order to assimilate the greatest



quantity of the nutrients present in carrots, it is important to chew them well - they are the exception to the rule - they are more nutritious cooked than raw (Anonymous, 2007).

Composition and energetic value of the carrots are as follows: Edible part 95%, Water 91.6g, Proteins 1.1g, Lipids 0g, Available sugars 7.6g, Nutritional fiber 3.1g, Energy 33kcal , Sodium 95mg, Potassium 220mg, Iron 0.7mg, Calcium 44mg, Phosphorus 37mg, Niacin 0.7mg, Vitamin C 4mg

One carrot 7 inches long and about 1 inch in diameter, yields the following nutrients: 27 mg. Calcium, 26 mg. Phosphorus, 0.5 mg. Iron, 34 mg. Sodium, 246 mg. Potassium, 7,930 I.U. vitamin A, trace amounts of vitamin B-complex, 6 mg and Vitamin C (Wikipedia 2007).

This common vegetable, usually eaten raw in salads and also used to prepare sauces and savory dishes, contains several active ingredients, among which beta-carotene, which is a substance that is transformed by the organism into Vitamin A.

Beta Carotene (Vitamin A) is necessary for proper growth & repair of body tissues; helps maintain smooth, soft disease-free skin; helps protect the mucous membranes of the mouth, nose, throat & lungs, thereby reducing susceptibility to infections; protects against air pollutants (antioxidant effect against free radicals); counteracts night-blindness & weak eyesight; and aids in bone & teeth formation. Current medical research shows that foods rich in Beta Carotene will help reduce the risk of lung cancer (especially in smokers who literally 'burn' a lot of Vitamin A) & certain oral cancers. Unlike Vitamin A from fish liver oil, Beta Carotene is non-toxic.



## Nutritional Contents and Uses of Carrots

Italian National Institute of Nutrition states that the ancient healers have regarded carrot as the 'herbal healer' of skin diseases. Indeed Vitamin A or beta-carotene, of which carrot is rich, can be considered the main vitamins for the skin. Dry skin, with impurities, acne, and difficulty in tanning, sunburns, eritema, and premature appearance of wrinkles - all these things can depend largely on an insufficient intake of this vitamin.

Carrots are credited with many medicinal properties; they are said to cleanse the intestines and to be diuretic, mineralizing, anti-diarrhea, an overall tonic and anti-anemic. Carrot is rich in alkaline elements, which purify and revitalize the blood. They nourish the entire system and help in the maintenance of acid-alkaline balance in the body. The carrot also has a reputation as a vegetable that helps to maintain good eyesight. Raw grated carrot can be applied as a compress to burns for a soothing effect. Its highly energizing juice has a particularly beneficial effect on the liver. Consumed in excessive quantities, carrots can cause the skin to turn yellow; this phenomenon, which is called "Carotenemia" and caused by the carotene contained in carrots, is frequently seen in young children but is not at all dangerous (Anonymous, 2007).

Medicinally, carrot was used as a stimulant in the treatment of dropsy, flatulence, chronic coughs, dysentery, windy colic, chronic renal diseases and a host of other uses. Eating carrots is also good for allergies, anemia, rheumatism, tonic for the nervous system. Everyone knows they improve vision; But it does not stop there the delicious carrot is good for diarrhea, constipation (very high in fiber), intestinal inflammation, cleansing the blood (a liver tonic), an immune system tonic. Carrot is traditionally recommended to weak, sickly or rickety children, to convalescents or pregnant women,



its anti-anemic properties having been famous for a long time. Tea made the seeds can promote the onset of menstruation. It is effective on skin problems including broken veins/capillaries, burns, creeping impetigo, wrinkles and sun damage. Carrots also help in stimulating milk flow during lactation. Believe it or not the carrot is also effective against roundworms and dandruff. Pureed carrots are good for babies with diarrhea, providing essential nutrients and natural sugars (Anonymous, 2007).

The carrot is an ancient remedy mentioned in the writings of Pliny. Studies completed recently show that increasing daily consumption of carrots as a good source of beta-carotene can significantly reduce the risk of heart attacks and strokes in women. According to another study, stroke patients are more likely to survive and recover if they have significant levels of beta-carotene in their bloodstream. Regular consumption of carrots may also reduce the risk of lung and larynx cancer, even in former smokers. The carrot has been used to treat intestinal parasites, diarrhea, digestive problems, and high cholesterol. Perhaps its most famous use, to help eyesight, has been confirmed by science: carrots contain vitamin A, a source of retinal, a compound that in combination with proteins forms the visual pigments of the retinal rods and cones (Anonymous, 2007).

Carrot is also a wonderfully cleansing medicine. Carrot supports the liver, and stimulates urine flow and the removal of waste by the kidneys. The juice of organically grown carrots is a delicious drink and a valuable detoxifier. Carrots are rich in carotene, which is converted to vitamin A by the liver. This nutrient acts to improve night blindness as well as vision in general. The raw root, grated or mashed, is a safe treatment for threadworms, especially in children. Wild carrot leaves are a good diuretic. They have been used to counter cystitis and kidney stone formation, and to diminish stones that have



already formed. The seeds are also diuretic and carminative. They stimulate menstruation and have been used in folk medicine as a treatment for hangovers. Both leaves and seeds relieve flatulence and gassy colic, and are a useful remedy for settling the digestion and upsets of the stomach (Anonymous, 2007).

### Product Innovation

The term innovation may refer to both radical and incremental changes to products, processes or services. The often unspoken goal of innovation is to solve a problem. Innovation is an important topic in the study of economics, business, technology, sociology, engineers. Since innovation is also considered a major driver of the economy, the factors that lead to innovation are also considered to be critical to policy makers.

The Free Encyclopedia states that in the organisational context, innovation may be linked to performance and growth through improvements in efficiency, productivity, quality, competitive positioning, market share, etc. All organisations can innovate, including for example hospitals, universities, and local governments (Wikipedia 2007).

While innovation typically adds value, innovation may also have a negative or destructive effect as new developments clear away or change old organizational forms and practices. Organizations that do not innovate effectively may be destroyed by those that do. Hence innovation typically involves risk. A key challenge in innovation is maintaining a balance between process and product innovations where process innovations tend to involve a business model which may develop shareholder satisfaction through improved efficiencies while product innovations develop customer support



however at the risk of costly R&D that can erode shareholder returns. Four commonly accepted types of innovation are Product, Process, Position and Paradigm (Tidd, Bessant and Pavitt, 2005).

Innovation has been studied in a variety of contexts, including in relation to technology, commerce, social systems, economic development, and policy construction. There are, therefore, naturally a wide range of approaches to conceptualising innovation in the scholarly literature (Fagerberg et al., 2004).

Fortunately, however, a consistent theme may be identified: innovation is typically understood as the *introduction* of something *new* and *useful*, for example introducing new methods, techniques, or practices or new or altered products and services (Wikipedia 2007).

#### Nature of Consumers on Sensory Evaluation

As cited by Gatchalian (1989), Martin (1973) and Stone and Sidel (1978) stated that consider customers as naïve, not even capable of performing simple sensory evaluation tasks. They are known to be very subjective (Elrod, 1978), “quick to accept familiar and slow to approved the unusual”) Girardot, 1952). Often times, the consumer spends little time using the product and much less in evaluating it (Elrod, 1978), They are neither knowledgeable about descriptive terms used in sensory evaluation nor are they patient enough to try to understand long explanations or instructions. Consumers are also impressionistic and are quick to make conclusions about commodities presented to them for judgment mainly on their own feelings and perceptions. Consequently, their



impressions and judgment may be entirely different from those of trained laboratory panelist (Cross, et al., 1978. Klemmer 1968; Pangborn and Russel, 1976).

### Sensory Evaluation

Sensory Evaluation as defined by the Sensory Evaluation Division Of the Institute of Food technologies is a scientific discipline used to evoke, measure, analyze and interpret reactions to those characteristic of foods and materials as they perceived by the senses of sight of smell, smell, taste touch and hearing. Sensory evaluation is a procedure that is used quite often in foods science and technology because such sensory characteristics of foods products as flavor (odor and taste), color and texture are closely involved with consumer appreciation and acceptance (Wasserman, 1981). It is no more an art, which can be done only by few experts. It has become a science, which can be taught in a very systematic way.

The simple concept of sensory tests has been utilized even at the earliest periods of mans existence. Man, since creation, has relied on his senses and experience in the selection of commodities that he needs (Gorman, 1975). The distinct for survival has sharpened all his faculties to enable him to select the safe from the harmful. Wrong selection could mean dissatisfaction, pain or even death. Though primitive, the methods applied have proven their worth in the form of man's continued experience (Gatchalian 1989).

Total or overall sensory evaluation of foods is highly complex because it involves the use of several senses, each of which evaluating one sensory parameter (Kramer, 1973a). Although sensory evaluation is the ultimate measure of sensory qualities of food





products, it is always subjective, time consuming and costly (Noble, 1975). Due to these problems or precision, calibration and/or cost it is desirable in many instances to replace subjective measurements of the sensory properties of foods with objective physical chemical methods, which are always calibratable, using appropriate references of blanks (Kramer, 1973a; Kramer, 1969).

### Product Evaluation

A cited by Mabesa (1986), preference tests between company and competitive products should be regularly conducted for assurance of a place in the market or to check for possible shift in consumer acceptance. This activity becomes most useful when a slight slump in product sale starts to show. Unless some definite factors can be attributed to the decline, product quality and acceptability must be reviewed (Klemmer, 1968).

Product evaluation may also include development of objective test procedures on the basis of sensory data. Perhaps correlation studies between known chemical and physical tests and sensory evaluation results could be done. It is of great importance especially to the industry to be able to translate sensory information into those measurable by instruments. This way, data could be anchored to some objective tests (Elliot, 1969; Kramer, 1976; Powers, 1976; Quinlan, et al., 1974; Stone and Sidel, 1978; Szczesniak, 1972; Tilgner, 1962).

### Consumer Acceptance

Gatchalian (1989), quoted that consumer acceptance indicates the degree of like or dislike for a given product. The expected response is either a rejection or acceptance



(Pangborn, 1977) in varying degrees. Comparisons between products are not used necessarily required and preference is not expected and vice versa. A general term used to apply to tests for both outcomes is called “effective sensory test” (Stone and Sidel, 1978). Generally, A large number of respondents is required for present target or potential target populations (SED, IFT; 1981). Panel members are selected in accordance with a number of criteria which frequently include: (1) previous use of the product, (2) size of the family or age of specific family members, (3) occupation of household, (4) economic or social level and 5 geographic areas (SED, IFT; 1981).

### Product Acceptability

As cited by Del Rosario (2007), entrepreneurs or processors should have knowledge on the consumer acceptability on their products. It is necessary in finding out the appropriateness of the product to prospective buyers, determining the market positioning of their products, and in market positioning of their products. It also aids in the improvement of a product based on the comments of consumers who tested the product (Sim, 2005).

### Definition of Terms

**Product** – It is a good, service or idea consisting of bundle of tangible and intangible attributes that satisfies consumers and received for value.

**Product strategy**- Approaches in making the product more attractive to the customers and can include quality, brand, label and packaging among others.

**Price**- the value paid for a product or service



Profile – refers to the formal documentation of the strengths and weaknesses of a business unit

Educational attainment – refers to the formal attendance in school as required by the Department of Education.

Innovation—an idea or practices imposing a new material or technology that is considered to be new by the individual, because it is qualifiedly different from existing firms.

Appearance and color– the size and shape of pieces of food and the brightness and trueness of the color of a product is judge by the eye. Sight also plays a part in assessment of the light of foods like breads and cakes.

Texture – refers to the coarseness or smoothness of the product considering the graininess, brittleness and chewiness.

Taste – is the perception of stimuli and is sensed by the taste buds. Taste buds are minute depressions located primarily located in the papillae (bright-pink spots) on the tongue.

Flavor – is the sensation caused by, and those properties of any substances taken into the mouth, which stimulate one or both of the sense of taste and smell.



## **METHODOLOGY**

### Locale and Time of the Study

The study was set-up at the Department of Agricultural Economics and Agribusiness Management (DAEAM) building, College of Agriculture, Benguet State University. This study was conducted on February 2008.

### Product Materials

Carrots	Pepper	Salt	Garlic
Onions	Egg	Soy Sauce	Cornstarch

### Product Preparation

Sanitize all the materials to avoid food contamination then wash with clean water before peeling. Grate the carrot and slice the ingredients into small pieces, then mix it together with the egg and flour. After mixing shape it into your desirable shape (round, square). Then fry it on a pan with the boiling lard at a designated time and temperature.

### Judges/Evaluators

The evaluators/taste-panelists of the study are the students who are knowledgeable on cooking and burger lovers, teachers, cook/chef and burger stand seller/owner. There were twenty-eight (28) student panelists (practically burger lovers and knowledgeable in cooking) and twenty-two (22) employees/cook/burger seller/stand owners a total of 50 evaluators all in all.



### Evaluator Recruitment

Selection and recruitment of evaluator's/judges/taste panelist starts just after the research proposal has been approved. The researcher-conducted survey approached to students, employees, cook and burger seller/stand owners where they are invited to evaluate the product. Selected evaluators, who are willing to come in a designated given time and date, were given invitation letter for the schedule or time and date of the sensory evaluation.

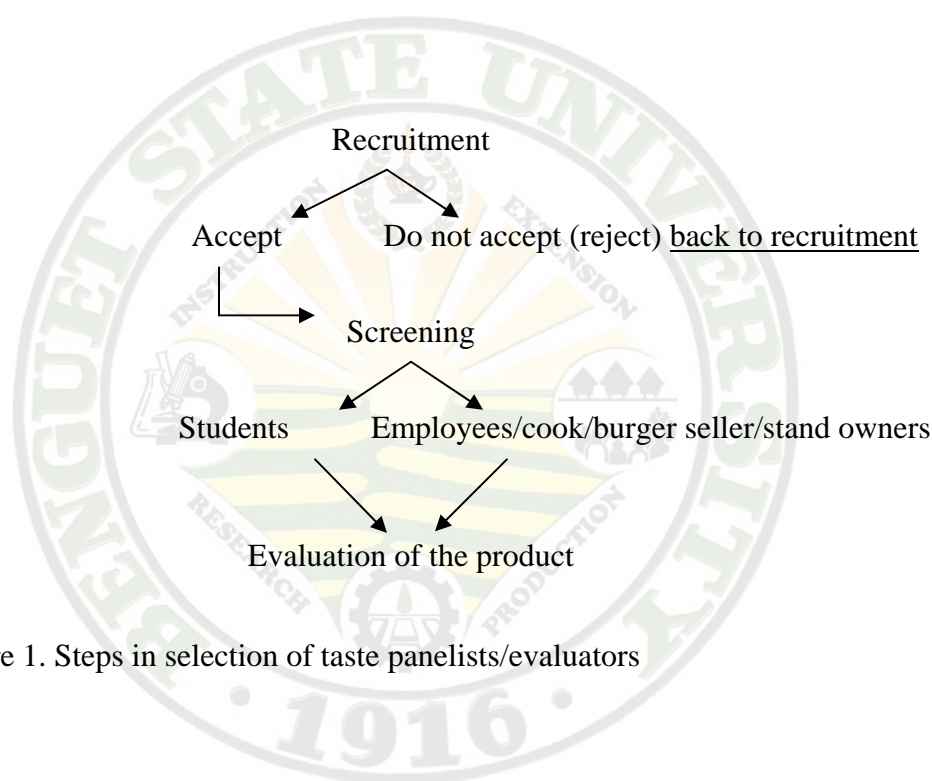


Figure 1. Steps in selection of taste panelists/evaluators

### Product Evaluation

Evaluation of this product is done through sensory or taste-test evaluation, which was set in the Month of February 2008. The product that was tested was prepared and cooked on the day it was evaluated. Two tables were set up on the Department of Agricultural Economics and Agribusiness Management (DAEAM) building, Benguet State University, where the panelist evaluated the product. Panelists were divided into two categories in evaluating the product. Students were the first one to evaluate the product



afterwards the employees/cook /burger stand seller/owner are next. Each and every one of them were given a copy of the evaluation form, simple briefing was done to the taste panelists for them to be familiarizes with the terminologies used in the procedure of the evaluation and also for the general step by step procedure. Taste panelist/evaluators were required to answer first the necessary questions of the profile before proceeding to the product evaluation. Panelist/evaluators were required not to chew gums 2 hours before the taste-test. Panelist/evaluators were advised to gurgle water before proceeding to the next sample. As they taste the product they answer the evaluation sheet at the same time.

### Data Analysis

Results of the sensory evaluation were collected by the researcher and were presented analyzed and interpreted using simple statistical tools such as: frequency counts, percentage, mean, and t-test.



## **RESULTS AND DISCUSSION**

### Carrot Patty Processing Process

The processing technology employed in the production of carrot patty was not similar to the other patties produce by the big corporations like ROELS Food Corporation, Pampangas Best, Nadeco Meifoods etc... This was a new innovated product made up of nutritious and vegetable ingredients without additives of seasoning, food coloring and MSG (Monosodium glutamate). This is a cholesterol free and high nutrient content rich in vitamin A. It is made up of starch; onions, pepper, garlic, salt etc. and carrot as the main ingredient.

### Distribution of Taste Panelist

Product acceptability test was done through taste-test/sensory evaluation to the target market of the product, which includes; 56% students distributed as follows 32% were knowledgeable on cooking and 24% burger lovers, there were also 8% faculties and staff and 10% burger stand owners. In addition, the researcher invited 26% knowledgeable evaluators like cook/ chef to further evaluate the product. Taste-test/sensory evaluation was done at the Department Agricultural Economics and Agribusiness Management building. Distribution of taste panelist is shown in Table 1.



Table 1. Distribution of taste panelist

PARTICULAR	FREQUENCY (F)	PERCENTAGE (%)
Participating Students		
Burger lovers	16	32
Knowledgeable on cooking	12	24
TOTAL	28	56
Occupation/Profession		
Faculty and staff	4	8
Burger stand seller/owner	5	10
Cook/Chef	13	26
Students	28	56
TOTAL	50	100

#### Profile of Evaluators/Taste Panelist

Table 2 shows the profile of panelist as to sex, age, monthly allowance/income employment, educational attainment and civil status.

Sex. Thirty six percent 36 % are male and 64 % are female.

Age. Fifty six 56 % were from the bracket age of 14-20, 20 % were from ages 21-30, 6 % were from ages 31-40, 8 % were from ages 41-0, 8 % were from ages 51-60, and 2 % were from 60 and above.





Monthly allowance/income. Forty percent (40 %) of the panelists' monthly allowance/income ranges from 1000 and below, 22 % of the panelist had a monthly allowance/income ranging from 1000-3000, 22 % of the panelists' allowance/ income ranged from 3000-6000, 8% panelists has a monthly allowance of 6000-10000 and the least panelist fall from 10,000 and above.

Employment. Fifty-six 56 % were students, 26 % were cook/chef, 8% were faculties and staff and 10 % were burger stand seller/owner.

Educational attainment/level. Two percent 2 % were elementary level, 2 % were elementary graduate, 14 % were high school level, 8 % were high school graduate, 52 % were college level and there were 22 % evaluators/judges/taste-panelist who were college graduate.

Civil status. Sixty-eight 68 % were single, 30% were married and 2 % widowed. Figure 2 and 3 shows the students and the taste panelist evaluating the Carrot Burger product.



Table 2. Profile of evaluators/taste panelist

PROFILE OF EVALUATORS	FREQUENCY (F)	PERCENTAGE (%)
<b>Sex</b>		
Male	18	36
Female	32	64
<b>TOTAL</b>	<b>50</b>	<b>100</b>
<b>Age</b>		
14-20	28	56
21-30	10	20
31-40	3	6
41-50	4	8
51-60	4	8
61-70	1	2
<b>TOTAL</b>	<b>50</b>	<b>100</b>
Mean Age: 26.23		
<b>Monthly Allowance/Income</b>		
1000 and below	20	40
1000-3000	11	22
3000-6000	11	22
6000-10,000	4	8
10,000 and above	4	8
<b>TOTAL</b>	<b>50</b>	<b>100</b>
Mean: 3.270		



Table 2. Continued...

PROFILE OF EVALUATORS	FREQUENCY (F)	PERCENTAGE (%)
<b>Employment</b>		
Employed	23	46
Unemployed	27	54
<b>TOTAL</b>	<b>50</b>	<b>100</b>
<b>Educational Level/Attainment</b>		
Elementary Level	1	2
Elementary graduate	1	2
High school Level	7	14
High school Graduate	4	8
College Level	24	48
College Graduate	11	22
<b>TOTAL</b>	<b>50</b>	<b>100</b>
<b>Status</b>		
Single	34	68
Married	15	30
Widowed	1	2
<b>TOTAL</b>	<b>50</b>	<b>100</b>





Figure 2. The students of Entrepreneurial Technology answering the profile



Figure 3. Burger lovers evaluating the Carrot Burger 102

Level of Acceptability of Evaluators/Judges/Taste



### Panelist on Carrot Burger 101

Evaluators/judges/taste panelist evaluated the product as to color, appearance, texture, shape, taste, aroma, packaging and general acceptability.

Acceptability ratings used in the taste-test/ sensory evaluation scale are as follows: 7-extremely like, 6-like, 5-slightly like, 4-Neither dislike or like, 3-slightly like, 2-dislike, 1-extremely dislike. Result of the level of acceptability of the judges/evaluators/taste panelist is shown in Table 3.

Appearance. The panelist evaluated cooked Carrot Burger and results showed that half (50 %) of the panelist like the appearance of the product, 20 % slightly like, and 16 % extremely like the appearance. On the other hand, 4 % slightly dislike, another 4 % dislike and 6 % neither dislike nor like the appearance of the product. Result implies that majority of the taste-panelist still like the product. Figure 4 shows the appearance of the Carrot Burger 101.



Figure 4. Appearance of CB 101 (Carrot Burger 101)



Aroma. Aroma is an important factor to be evaluated on a product especially food because it plays a big role in providing an idea of the taste of a food product. The aroma of Carrot Burger 101 smells like meat but the garlic and onions are very strong and a little smells of carrot. From the selected evaluators/judges, majority (48 %) like its smell/aroma, 22 % like it, 12 % neither dislike nor like it and there were 8 % who extremely like the smell, but still there were 8 % who slightly dislike, 8 % dislike and 2% extremely dislike it due to the strong smell of the garlic and onions as commented by the cook/chef.

Color. The carrot burger 101 is light orange in color, which is the color of the main ingredient. Most of the evaluators like it, as an evident on the evaluation results of carrot burger 101, majority (54 %) of the panelist like the color, 24 % of the panelist like it slightly, 8 % like it extremely, 6 % slightly dislike, 4 % also dislike and there were 4 % of the taste panelists/evaluators who neither dislike or like the color of the product. This implies that the taste-panelists/evaluators like the color of the carrot burger 101.

Packaging and label. The packaging material in Carrot Burger 101 is similar with the packaging of Roel's Food Corporation, Carrot Burger were labeled in Styrofoam before wrapping it with cellophane. The only difference is the cellophane used by the Roel's Food Corporation is printed with its label. Packaging is used to promote the product presentable and protection against contamination, prolonging the shelf life of a product.

Most (36 %) of the evaluators/ judges like the packaging and 34 % extremely like, and 12 % slightly like its packaging. There were also 6 % panelist who slightly dislike and 4 % dislike it for the reason that its' packaging is not environment friendly. Still, 2 %



of the panelists were undecided whether they neither like nor dislike the packaging. Result shows that evaluators like the packaging because it is colorful and attractive to consumers/customers. Packaging of the CB 101 is shown in Figure 5.



Figure 5. Packaging of CB 101 (Carrot Burger 101)

Taste. For the taste parameter, most (36 %) of the panelist like the taste, 30 % slightly like it and there are 18 % who extremely like the taste, 6 % panelist slightly dislike, 4 % dislike and another 4 % cannot decide whether they like it or not.

Texture. Texture of a product is also important because it affects the marketability. In Carrot Burger 101 half (50 %) of the evaluators/judges like, 28 % slightly like, and 8 % extremely like. There were 8 % panelists who dislike, 8 % slightly dislike it, and 4 % panelists neither dislike nor like it.



Table 3. Level of acceptability of evaluators/judges/taste-panelist on Carrot Burger 101

CRITERIA	LIKE EXTREMELY		LIKE		SLIGHTLY LIKE		NEITHER DISLIKE NOR LIKE		SLIGHTLY DISLIKE		DISLIKE		EXTREMELY DISLIKE	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
	Appearance	8	16	25	50	10	20	3	6	3	6	2	4	-
Aroma	4	8	24	48	11	22	6	12	6	12	1	2	1	2
Color	4	8	27	54	12	24	2	4	3	6	3	6	-	-
Packaging	17	34	19	36	6	12	1	2	1	2	3	6	-	-
Taste	9	18	19	36	15	30	2	4	2	4	3	6	-	-
Texture	4	8	25	50	14	28	2	4	2	4	4	8	-	-
<b>TOTAL</b>														





Level of Acceptability of Evaluators/Judges  
Panelist on Carrot Burger 102

Evaluators/ taste-panelist of this product were the same persons who evaluated the CB 101, similar taste-test strategies and tools were employed on the second product. Result on the level of acceptability of the taste panelist on Carrot Burger 102 is shown in Table 4.

Appearance. Most (32 %) just like it, 30 % slightly like and 14 % gives a rating of one, which means they like it extremely and 4 % of the panelist neither dislike nor like its appearance. This implies that Carrot Burger 102 passed in the acceptability in appearance as evaluated by the evaluators/judges. Appearance of the Carrot Burger 102 is shown in Figure 6.



Figure 6. Appearance of CB 102 (Carrot Burger 102)

Aroma. Fifty six (56 %) like the smell, 28 % slightly like it and 8 % extremely like, due to its meaty like smell, 6 % neither dislike nor like and 2 % slightly dislike its



aroma.

Color. The color of Carrot Burger 102 is the same as those patty products made up of beef. Majority (32 %) Panelist rated like the color of the product, 24 % extremely like it, 20 % panelist who neither dislike nor like the product color, 20% slightly like, 2 % neither dislike nor like and only 2 % slightly dislike the color. Result shows that majority likes and like extremely the color of the CB 102.

Packaging and label. The packaging employed in CB 102 uses only cellophane to cover the product, and most (36 %) like the packaging unlike Carrot Burger 101 which uses Styrofoam that is not environment friendly, 26 % slightly like the material used, 14% extremely like it, 14 % neither like nor dislike the packaging, 8 % dislike the cover and 2 % slightly dislike it because is not so attractive and during arrangement/delivery the product may be damaged.



Figure 7. Packaging of CB102 (Carrot Burger)



Taste. For the taste parameter of the Carrot Burger 102 majority, (52 %) like it, 24% extremely like the taste and few 12 % slightly like. There were also 4 % who slightly dislike and 4 % neither like nor dislike the taste of the product.

Texture. Carrot Burger 102 has a soft texture and majority (52 %) of the panelist rated it 2 meaning they like the texture of the product, and 22 % like it extremely, 22 % slightly like and only two (4 %) extremely dislike its texture.

Results of the evaluation on the carrot Burger 102 by the evaluators/taste panelist from its color, appearance packaging aroma texture and taste as shown in the discussion above, is acceptable to the panelist likewise to the target consumers.

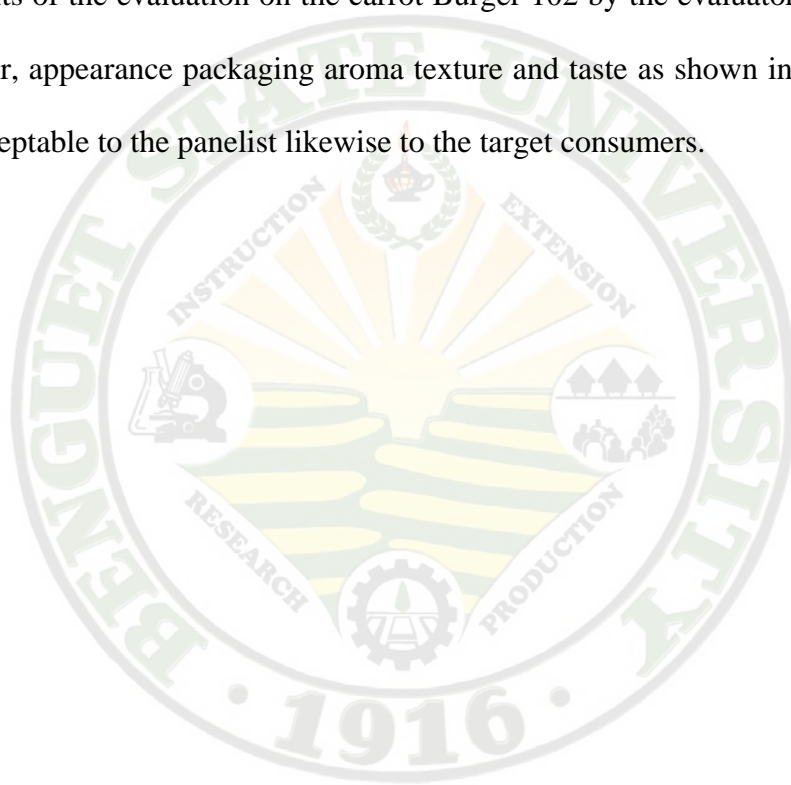


Table 4. Level of acceptability of evaluators/judges/taste-panelist on Carrot Burger 102

CRITERIA	LIKE EXTREMELY		LIKE		SLIGHTLY LIKE		NEITHER DISLIKE NOR LIKE		SLIGHTLY DISLIKE		DISLIKE		EXTREMELY DISLIKE	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
	Appearance	7	14	6	32	15	3	2	4	-	-	-	-	-
Aroma	4	8	28	56	14	28	3	6	1	2	-	-	-	-
Color	12	24	26	32	10	20	1	2	1	2	-	-	-	-
Packaging	7	14	18	36	13	26	7	14	1	2	4	8	-	-
Taste	12	24	28	56	6	12	2	4	2	4	-	-	-	-
Texture	11	12	26	52	11	22	-	-	-	-	-	-	2	4
<b>TOTAL</b>														





Front

**Ingredients:** Carrots, soy sauce,  
Salt, pepper, onions, garlic, cornstarch

**BEST BEFORE:**

--	--	--

Did you know that Beta carotene (vitamin A) is necessary for proper growth & repair body tissues; helps maintain smooth, soft disease-free skin; helps protect the mucous membranes of the mouth, nose, throat and lungs reducing susceptibility infections and protects against pollutants. It also counteracts night-blindness & weak eyesight; and aid in bone & teeth formation. Unlike Vitamin A from fish and liver oil Beta-Carotene is Non-toxic.

**Nutrition Facts**  
Serving size 5 pieces (50 g)  
Serving per pack 5 pieces  
Amount per serving

	% daily value
Total Fat 0g	0%
Proteins 1.1g	5%
Lipids 0 g	0%
Sugars 7.6g	6%
Nutritional fiber 3.1 g	2%
Sodium 95mg	9%
Potassium 220mg	14%
Iron 0.7mg	4%
Calcium 44mg	7%
Phosphorus 37mg	2%
Niacin 0.7 mg	1%
Vitamin C 25 %	
Vitamin A 700%	
(as alpha- and beta-carotene)	

**Comments and Suggestions**  
Feel free to visit:  
[www.de\\_mufette.com.ph](http://www.de_mufette.com.ph)  
For orders contact no. 09295190321



NOTE: This packaging is only a sample

Back

Figure 8. Label used in the product



Evaluation Analysis and Distribution of Distinctive  
Taste and Preferred Shape of the Carrot  
Burger 101 and Carrot Burger102

Taste panelists were also asked to evaluate the taste as to distinct carrot taste, meat taste, egg taste, and starchy/floury taste. On the distinctive taste of Carrot Burger 101, Half (50 %) of the panelist identified the distinct carrot taste, 30 % mentioned the floury/starchy taste, 14 % said that meat taste is strong, and 6% of the evaluators said that CB 101 is more on egg taste.

The taste panelist evaluated the Carrot Burger 102 from the collected data and most (48 %) of the panelist mentioned that it is meat taste, 28 % tells that the floury/starchy taste is strong, 16 % says that it is carrot taste, and few 8 % evaluators tells that CB 102 is more on egg taste. The distribution of distinctive taste and preferred shape of the two products are shown in Table 5.

Evaluators/taste panelists were also asked on the preferred shape of the burger products. They were to choose between round and square shape. Results showed that most (56 %) like round shape because it is the most common/popular shape while 44 % preferred square because it is more attractive to eat when the four sides of the patty is prominent.



Table 5. Distribution of distinctive taste and preferred shape of CB 101 and CB 102

CRITERIA	CARROT BURGER 101		CARROT BURGER 102	
	F	%	F	%
<b>Taste Comparison</b>				
Meat Taste	7	14	24	48
Carrot Taste	25	50	8	16
Egg Taste	3	6	4	8
Starchy/Floury	15	30	14	28
<b>TOTAL</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>
<b>Preferred shape</b>				
Round	28	56	28	56
Square	22	44	22	44
<b>TOTAL</b>	<b>50</b>	<b>100</b>	<b>50</b>	<b>100</b>



General Acceptability of the Panelist  
On Carrot Burger 101 and 102

Table 6 shows that most 38% panelist liked the CB 101 and 24% of the panelist slightly like it. There were also 14 % who dislike the product, with 2% who slightly dislike, and 14% who neither dislike nor like it. For Carrot Burger 102 more (48 %) panelist answer that they like the product and 22% who extremely like more than the Carrot Burger 101, with an 18% panelist slightly like, and there were only 12 % who neither dislike nor like the product.

Table 6. General acceptability of the taste panelist on Carrot Burger 101 and 102

CRITERIA	CB 101		CB 102	
	F	%	F	%
Extremely Like (7)	4	8	11	22
Like (6)	19	38	24	48
Slightly Like (5)	12	24	9	18
Neither Like or Dislike (4)	7	14	6	12
Slightly Dislike (3)	1	2	-	-
Dislike (2)	7	14	-	-
Extremely Dislike (1)	-	-	-	-





Price Acceptability of CB 101 and 102 and Suggested Price of the Taste Panelist

The Carrot Burger product is price based on its' cost and computed at P26 /pack plus 4 peso mark-up coming up with P30/pack as retail price. At the price of P30, majority, (70%) of the panelist said it is affordable; however, 16 % are not willing to buy. Thirty percent, 30% of the panelist said that it is not affordable, however 84% were willing to buy at P30.00/pack price. There were also price suggested by the evaluators, the price ranged from P20-P50/pack and some panelist suggested a lower price or higher price as long as additional net content is added. Results are shown in Table 7.

Table 7. Price acceptability of Carrot Burger 101 and 102 and suggested price of the evaluators / judges

PARTICULAR	CARROT BURGER 101 AND 102	
	FREQUENCY (F)	PERCENTAGE (%)
Price		
Affordable	35	70
Not Affordable	15	30
TOTAL	50	100
Suggested Price		
20	5	26.32
25	11	57.90
28.50	1	5.26
30	1	5.26
50	1	5.26

\*Multiple response



Panelist Outlook on Carrot  
Burger Products

Opinions of the evaluators/taste panelist were solicited why they like the product. Appearance, aroma, taste, color, packaging and label, texture and over all assessment of the product affects the acceptability of the product and being a customer they also need and meet satisfaction on the product or service that they are paying. Thus, every comment either positive or negative is necessary for the improvement of the product. On the part of this product many outlooks were gathered. Results are shown in Table 8.

Table 8. Panelist opinion why do they like the product

OPINION	FREQUENCY (F)	PERCENTAGE (%)
It is nutritious and good for daily consumption	7	15.22
Product introduced is from indigenous source/vegetable	2	4.35
Taste like meat/beef so it can be a best Substitute from this ingredients	8	17.39
Delicious and Good taste/ attractive aroma /texture and spicy	12	26.09
Ingredients are natural No preservatives added	5	11.41
Affordable and delicious than the product they sold outside	5	10.87
Good packaging	1	2.17
Healthy, No cholesterol/fat and It can be used as a balanced diet	8	17.38

\*Multiple response



Reasons Why Panelist Do Not Like the Product

Not only the reasons, why the evaluators/taste-panelist like the product but also the reasons why they do not like it were also solicited. Opinions were based on the overall assessment of the two Carrot Burgers. In terms of taste, some do not like it because it is starchy/floury, some panelist also differ in taste preference, like for example on the ingredients, some would say they do not like the product if it is spicy but some also like if the burger is spicy. The price is also one of the reasons why they do not like the product. Results are shown in Table 9.

Table 9. Panelist opinion why they do not like the product

OPINION	FREQUENCY (F)	PERCENTAGE (%)
Palatability is floury/starchy taste	4	14.29
Many peppermint/Spicy	4	14.28
Too much oil used in cooking/Oily	2	7.14
Salty	3	10.14
Bad taste/aroma/texture	6	21.43
Slightly wet/soft	2	7.14
Higher price than the other products	2	7.14
Not spicy	1	3.57
Aroma of onion and garlic is strong Lot of seasoning	3	10.71

\*Multiple response



Comments and Suggestions of the Panelist for the Improvement of the Carrot Burger Product

Comments and suggestions for the improvement of the product were solicited from the taste panelist. Results showed that the 2 products were acceptable and favorable to the panelist. However, there were comments and suggestion on these two Carrot burgers according to the evaluators, the product has a potential in the market because it uses materials and ingredients that are nutritious, thus, it is healthy, moreover, it is delicious and surely the kids will like it. This product is a good innovation by using indigenous materials. More of their suggestions are seen in Table 10.

Table 10. Comments and suggestions of the panelist for the improvement of the Carrot Burger product

SUGGESTIONS AND COMMENTS	FREQUENCY (F)	PERCENTAGE (%)
Reduce the pepper because it is not good for the kids	4	10.26
Improve the taste and texture by adding meat	3	7.69
Add garnishing so that the color can be attractive	2	5.13
Improve the labeling and the packaging	7	17.94
Improve your skills in cooking	1	2.56
Add more flavoring (carrots)	3	7.68
Reduce salt (salty)	1	2.56
Indicate the expiration date in the label	2	5.13



Table 10. Continued...

SUGGESTIONS AND COMMENTS	FREQUENCY (F)	PERCENTAGE (%)
Reduce the flour/starch because it is dominant	4	10.26
Taste great/good	2	5.13
Aroma is weak	1	2.56
Have equal amount of spices	1	2.56
Thicker slice	2	5.13
Oily, Reduce oil	3	7.69
Try to dehydrate the carrot	2	5.13
Try to steam before molding	1	2.56

\*Multiple response

#### Competing Products of Carrot Burgers Produced by the Researcher

Competing products of carrot burgers are of different sizes, amount and quantity and price. There are five (5) competing products of Carrot burger as shown in Table 11. Products from the other companies also use the same packaging as the Carrot burgers produced by the researcher. The main ingredient by the competing products uses the same ingredient, which is the beef. From the packaging Roel's Food Corporation and Pure Foods-Homel uses also Styrofoam before packing it with printed cellophane as its label. Pure foods- Homel Company only uses Styrofoam in a ten (10) pieces net content but for five (5) pieces net content it uses only printed cellophane as its packaging including Mei foods Corporation. For the Pampanga's best and Food sphere Inc., this two



company uses the same covered plastic cups as the packaging material on their product and it is sealed on the opening, and labeled sticker is used which is stick on the cover.

Table 11. Competing products of carrot burgers produced by the researcher

MANUFACTURERS	NET WT. (g)	SIZE	PRICE	QTY	PRODUCT NAME	MARKET OUTLET
The Pure foods-Hormel Company	225g	Big	34	5	Vida Cheese burger	Emmanuel Grocery
Nadeco Meifoods Corporation	250g	Small	28	7	Nadeco Hamburger	Roel's and Meken outlet
Food Sphere Inc.	225g	Big	37.75	5	cdo Ulam Burger	456 Commercial Center
Pampanga's best	450g	Medium	69	10	Hamburger Patties	456 Commercial Center
Roel's Food Corporation	480g	Big	7	10	Roel's Hamburgers	456 Commercial Center



## **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### Summary

This study was conducted to find out the level of acceptability of Carrot Burger product as to the color, texture, appearance, shape, aroma, taste, packaging and the general acceptability to find out the consumers or potential consumers and the criteria/factors affecting the acceptability of carrot burger.

There were 28 students, 23 were college and 5 were from high school, 13 cook/chef, 4 teachers and 5 burger stand seller/owner who served as the product evaluators/taste-panelist in the product testing. Product testing is done through sensory evaluation wherein the panelist evaluated the product as to appearance, taste, texture, aroma, packaging, color and price.

Based on the results of the study, the level of acceptability of the students and pupils is rated 5-7. It means that the product is acceptable in terms of appearance, texture, aroma, and taste. Statistical analysis using t-test also shows that CB 101 and CB 102 were not significantly different in terms of color, shape, aroma, texture, taste, packaging and appearance but as to the general acceptability, the 2 products CB 101 and CB 102 is highly significant

Evaluators' opinion including comments and suggestion from the two products were also solicited, it includes the following: the product is good, meaty in taste, good packaging but it needs improvement, ingredients like onion and pepper are to many for kid's preferences



## Conclusions

From the result the following conclusion were drawn:

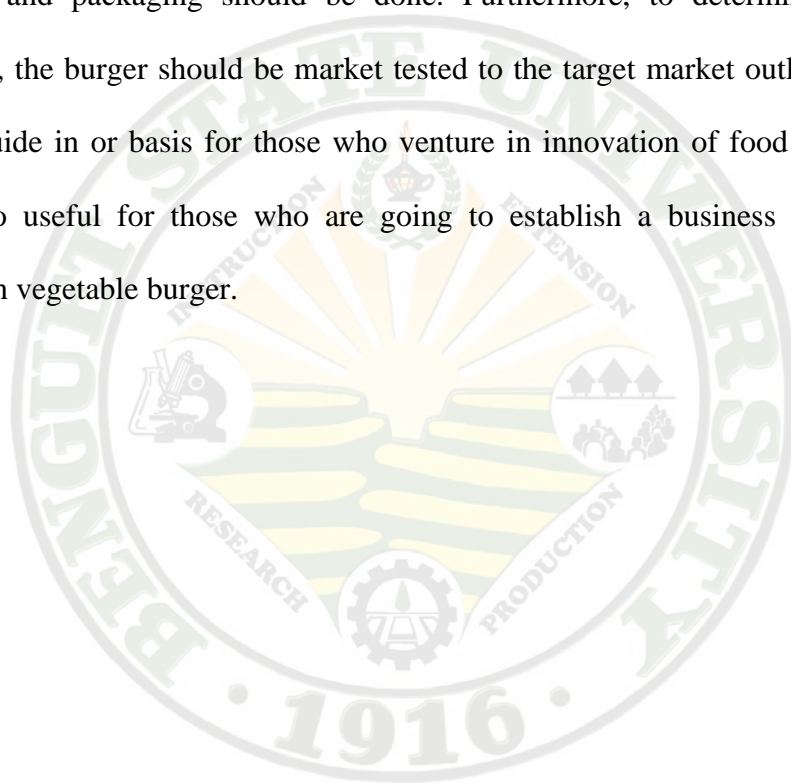
1. The level of acceptability of the taste panelist for the two (2) Carrot Burger products was rated mostly from 5-7, which was slightly like, like and extremely like.
2. The panelists dislike the color, aroma and texture of Carrot Burger 101.
3. The panelists dislike the texture and packaging of Carrot Burger 102.
4. The color, taste, packaging, size and price and most of all the mouth feel are the factors influencing the acceptability of consumers on the product
5. The potential consumers of the CB product are the school children, adolescents, young adult and also adult and the primary consumers are the burger stand owner/seller and burger lovers who like fast food
6. The panelist like the 2 burgers (CB 101 and CB 102), but CB 102 is most liked.





### Recommendations

Being an entrepreneur or food processors who introduced a new product in the market, strategies are considered like pricing, promotions, distribution, place /location are important matters to study to have competitive products in the market. The two Carrot Burger products that were evaluated is a good product to be marketed because it has potential, and it is healthy and nutritious. However, further research and improvement of the product and packaging should be done. Furthermore, to determine the market acceptability, the burger should be market tested to the target market outlets. This study should be guide in or basis for those who venture in innovation of food products. This study is also useful for those who are going to establish a business like fast food, specialized in vegetable burger.



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## APPENDICES

Appendix Table 1. General acceptability as to color, appearance, texture, shape, aroma packaging and taste

CRITERIA	MEAN		t-value	Probability Associated
	CB 101	CB 102		
Color	5.35	5.94	-0.1091 <sup>ns</sup>	0.9149
Appearance	5.51	5.76	-0.0334 <sup>ns</sup>	0.9739
Packaging	5.75	5.22	0.0851 <sup>ns</sup>	0.9336
Aroma	5.13	5.62	-0.0429 <sup>ns</sup>	0.9665
Texture	5.29	5.80	-0.0935 <sup>ns</sup>	0.9270
Taste	5.44	5.92	-0.1172 <sup>ns</sup>	0.9086
Over- All	5.41	5.73	-2.0499 <sup>ns</sup>	0.957

Legend: ns-not significant

### ANALYSIS OF VARIANCE

TREATMENT	SUMMARY OF SCORE		
	Mean	Standard deviation	Observations
1 (CB 101)	4.94	1.4902404	50
2 (CB 102)	5.8 **	.9258201**	50
TOTAL	5.37	1.3077469	100

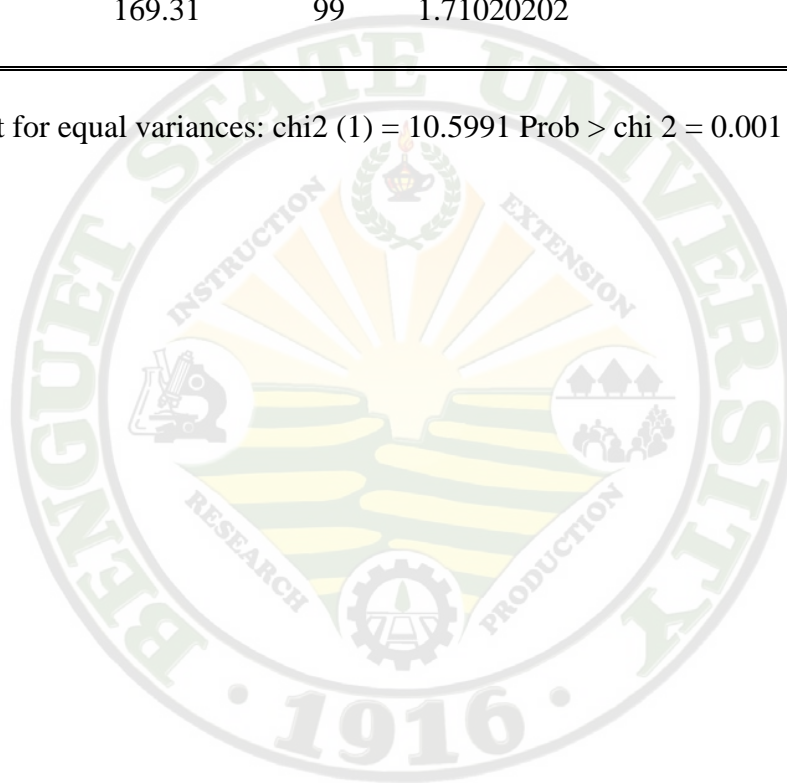
One-way score trt [f weight = freq], tabulated nofreq



## ANALYSIS OF VARIANCE

SOURCE	ANALYSIS OF VARIANCE				
	SS	df	MS	F	Prob>F
Between groups	18.49	1	18.49	12.01	0.0008
Within Groups	150.82	98	1.53897959		
TOTAL	169.31	99	1.71020202		

Bartlett's test for equal variances:  $\chi^2(1) = 10.5991$  Prob >  $\chi^2 = 0.001$



## APPENDIX A

## EVALUATION SHEET FOR INNOVATED CARROT PATTY

Name of evaluator (Compulsory): \_\_\_\_\_

Name of School/Address: \_\_\_\_\_

Are you employed? ( ) Yes ( ) No

Occupation? \_\_\_\_\_

Age: \_\_\_\_\_ Sex: ( ) Male ( ) Female Civil Status: ( ) Single ( ) Married  
( ) Widower

Educational Attainment/level

( ) Elementary level ( ) High school level ( ) College Level

( ) Elementary graduate ( ) High school graduate ( ) College Graduate

Monthly Allowance/Income;

( ) 1000 and below ( ) 1000-3000 ( ) 3000-6000 ( ) 6000-1000 ( ) 1000 and above

CRITERIA	SAMPLE 1 (Please answer it by checking)						
	Extremely Like	Like	Slightly Like	Neither like or Dislike	Slightly Dislike	Dislike	Extremely Dislike
COLOR							
APPEARANCE							
PACKAGING							
AROMA							
TEXTURE							
TASTE							
TASTE? ( ) Carrot Taste ( ) Meat Taste ( ) Egg Taste ( ) Starchy/Floury							

CRITERIA	SAMPLE 2 (Please answer it by checking)						
	Extremely Like	Like	Slightly Like	Neither like or Dislike	Slightly Dislike	Dislike	Extremely Dislike
COLOR							
APPEARANCE							
PACKAGING							
AROMA							
TEXTURE							
TASTE							
TASTE? ( ) Carrot Taste ( ) Meat Taste ( ) Egg Taste ( ) Starchy/Floury							

PREFERRED SHAPE: ( ) Round ( ) Square



**Product Price: \_\_P 30**

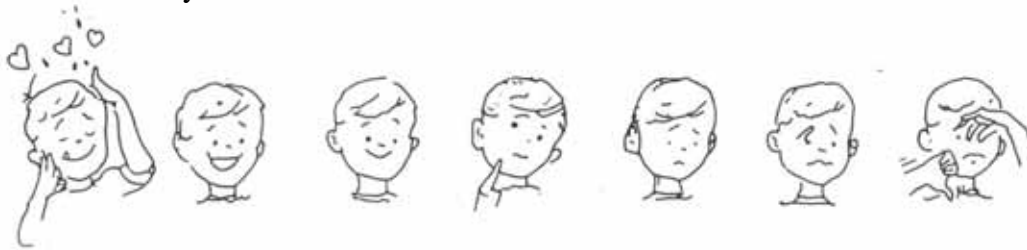
( ) Willing to buy ( ) Not willing to buy

Price: ( ) Affordable ( ) Not Affordable

Suggested price: \_\_\_\_\_

**GENERAL ACCEPTABILITY**

-Please encircle your choice



CB 101	7	6	5	4	3	2	1
CB 102	7	6	5	4	3	2	1
	Extremely Like	Like	Slightly Like	Neither Dislike Or Like	Slightly Dislike	Dislike	Extremely Dislike

Figure 9. Typical “Smiley” scale

Why do you like the product? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Why you do not like the product? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Comment and Suggestions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Thank very much for your time. God Speed!

DEO F BALANGEN  
 Student Researcher

