

## **BIBLIOGRAPHY**

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## **ABSTRACT**

The study was conducted in La Trinidad, Benguet to determine the acceptability of panelist/ consumers on the two formulation of fish patty product in terms of taste, texture, aroma, appearance, and their general acceptability to the product, including its packaging and price. Product Formulation A contains 70% fish tuna and 30% other ingredients while product Formulation B contains 50% fish tuna and 50% other ingredients and spices; this was done through sensory evaluation by 50 respondents.

After the sensory evaluation, a market testing was conducted to find the market potential of the product most accepted by the evaluators.

The findings revealed that the two product formulations did not differ significantly in terms of taste, texture, aroma, appearance, and general acceptability. The price that is acceptable and affordable by the consumers was P5 per piece or P55 per pack. The packaging most accepted by the consumers was the Packaging A.

The findings also revealed that there were repeated orders from the customers who bought the product. Majority said that they would buy the product once a week if the price is P55 but only a few would continue to buy the product on a weekly basis if the price will increase to P60.

## TABLE OF CONTENTS

	Page
Bibliography.....	i
Abstract .....	i
Table of Contents .....	ii
<b>INTRODUCTION</b>	
Rationale of the Study .....	1
Statement of the Problem .....	2
Objectives of the study .....	3
Importance of the study .....	3
Scope and Limitation .....	4
<b>REVIEW OF LITERATURE</b>	
Sensory evaluation .....	5
Perception .....	8
Consumer Testing .....	9
Acceptability .....	9
Factors to Consider during Sensory Evaluation .....	10
New product .....	10
Sensory Attribute of Food .....	11
The Marketer .....	11
Market Testing .....	12
Definition of Terms .....	12

## METHODOLOGY

Locale and time of the study .....	14
Respondents of the Study .....	14
Data Collection .....	14
Data to be gathered.....	15
Data analysis .....	15

## RESULT AND DISCUSSION

Product Description .....	16
Age and Types of Respondents .....	16
Sensory Evaluation of fish patties .....	17
Acceptability as to Taste Evaluation .....	17
Acceptability as to Appearance Evaluation .....	19
Acceptability as to Aroma Evaluation .....	21
Acceptability as to Texture Evaluation .....	22
General Acceptability of the Two Formulations .....	24
Panels Acceptability as to the Packaging of the Product .....	25
Panels Ratings on the Given Sample Price .....	27
Market Testing of the Product .....	28
Target Market Acceptability as to the Market Price .....	28
Consumers Mode of Buying the Product .....	29
Acceptability of the Improved Packaging of the Product.....	30
Consumers Willingness to Repeat the Order .....	32

## SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary ..... 33

Conclusion ..... 36

Recommendation ..... 36

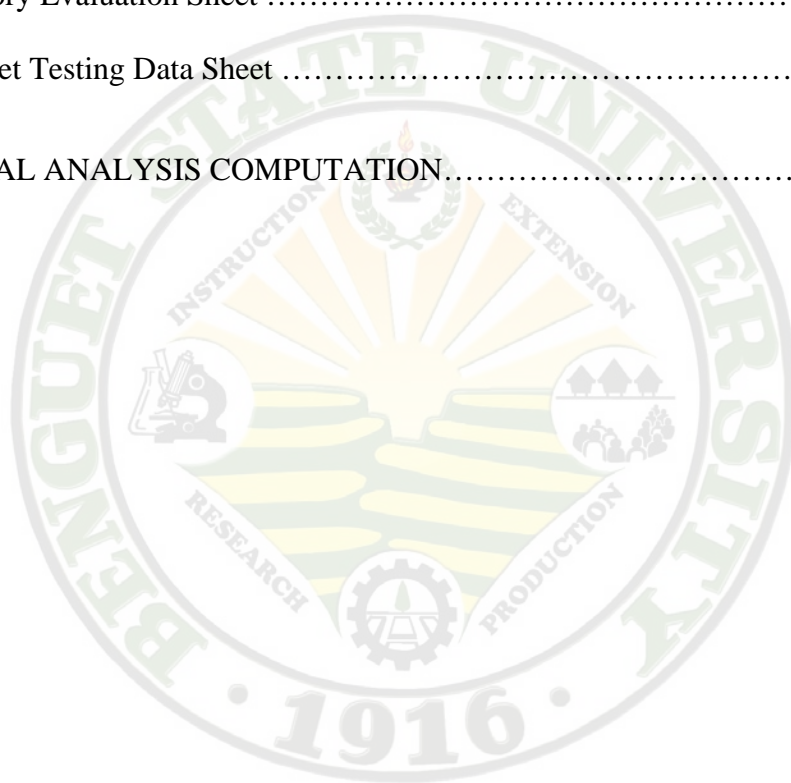
LITERATURE CITED ..... 38

## APPENDIX

Sensory Evaluation Sheet ..... 40

Market Testing Data Sheet ..... 42

STATISTICAL ANALYSIS COMPUTATION..... 44



## INTRODUCTION

### Rationale

Product evaluation is one useful tool for quality control. Products generally are evaluated when new recipe is being tested. However product evaluation should be continuing process to make as certain that the original high quality is maintained if not improved the responsibility for this important part of quality control should be assigned to a person or committee, but staff, employees and consumers often participate. Many large food services and most commissaries have facilities for product development and laboratories for product evaluation Hargar, et al, (1988) as cited by (Lumadew, 2007).

Consumers' acceptability is the key major factor to a successful new or innovative new product. Their taste and preferences including their purchasing power will help to determine the quality of the product to be produce. But the most critical factor is the market, the deciding factor in production Anderson (2006) as cited by (Dulawen, 2007).

Arazi and Kilcast, (2001) mentioned that without sensory evaluation or analysis, there is a high risk in market failure. Where sensory analysis was too frequently often overlooked as a requirement before product launch and introduced to the market, in order to suit the satisfaction of the consumers.

Production of new products which are healthy and nutritious is now the concern of food producers and processors, because consumers are now becoming health conscious (Ananayo, 2007). Some also look into new product in the market, prefer ready to cook or eat food and fast food.

Fish patty is considered a new product which does not exist yet in the food market. It is out of fish tuna (yellow fin tuna) and with other raw ingredients and spices. There are eight species of tuna and all of these are found and produce also in the Philippines. Yellow fin or “Thunnus albacares” in Latin word, which is the second tuna species in term of volume and popularity. They are found between 45°N and 40°S. They cover enormous distances around the globe, and all stocks mingle. Tuna fish are truly a nutrient- dense food. An excellent source of high quality protein, tuna are rich in a variety of important nutrients including the minerals selenium, magnesium, and potassium; the vitamins niacin, B1 and B6; and perhaps most important, the beneficial omega-3 essential fatty acids are so named because they are essential for our health but cannot be made by the body; they therefore be obtained from foods (George Mateljan Foundation, 2001-2007)

Since fish patty is new and not known by the consumers this study was done to find out what consumer say about the product. The “sensory evaluation of fish patty” aims to meet the appropriate formulation that could meet the desire of the consumers.

### Statement of the Problem

The study intends to answer the following questions:

1. What fish patty formulation is most accepted by the consumers/ panelist in term of taste, texture, aroma and appearance including and the general acceptability?
2. What is the level of consumers acceptability of fish patty base on their sensory evaluation?
3. What is the market potential of fish patty?

### Hypothesis

1. The fish patty product most accepted between the two formulations as to the taste, texture, and appearance and the general acceptability were formulation B, based on higher percentages of ratings. Except for the acceptability of aroma which formulation A is most preferred by the panelist.
2. The level of acceptability based on their sensory evaluation has no significant differences. This means the both formulations were almost the same in terms of taste, appearance, texture, aroma and the general acceptability.

### Objectives of the Study

The study aimed to:

1. determine the fish patty formulation most acceptable to the consumers/ panelist in term of taste, texture, aroma and appearance,
2. determine the level of consumers' acceptability on sensory of the fish patty, and
3. determine the market potential of the accepted fish patty formulation.

### Importance of the Study

The result of the study would help the processor to improve the product to suit the satisfaction of the consumers. This study would be useful to students who would be conducting similar studies in the future. It could also be a basis for further researched to improve the product quality.

### Scope and Limitation

This study was conducted in La Trinidad, Benguet where data is gathered. The study is focused in determining the acceptability of different formulations of fish patty products using hedonic scale based on sensory evaluation, the level of consumers' acceptability and market testing was done only in three locations in La Trinidad because of time and financial constraints.





## **REVIEW OF LITERATURE**

### Sensory Evaluation

The Institute of Food Technology (IFT) Sensory Evaluation Division U.S.A. defines sensory evaluation as “a specific discipline used to evoked , measure, analyze and interpret sensations as they are perceived by the senses of sight, smell, taste, touch and hearing” (Gatchalian, M., 1989).

As stated by Mabesa, L. B., (1986), it is a procedure that is used quite often in food science and technology because such sensory characteristics of food products as flavor (odor and taste), color and texture are closely involved with consumer appreciation and acceptance. She cited also that it is no more an art which can be done only by few experts. It has become a science that can be taught in a very systematic way.

According to Watts B., Ylimaki, G., Jeffrey, L., Elias, L., (1989), sensory analysis is a multidisciplinary science of sight, smell, taste, touch and hearing to measure the sensory characteristics and acceptability of food products, as well as many other materials. There is no one instrument that can replicate or replace the human response, making sensory evaluation component of any food study is essential. Sensory analysis is applicable to a variety of areas such as product development, product improvement, quality control, storage studies and process development.

Sensory evaluation is the science of judging and evaluating the quality of the food by the use of senses i.e. taste, smell, touch, sight and hearing. Sensory testing has been developed into a precise, formal, structured methodology that is continually being updated to refine existing techniques. Sensory evaluation is divided into methods,

subjective and objective testing. Subjective test involves objective panelist while objective testing employs the use of lab instrument with no involvement of the senses. Both tests are essential in sensory evaluation and necessary in a variety of condition (Oregon State University., 1998).

Reidy, E.J., (n.d), stated that sensory evaluation is a scientific discipline use to evoke measure, analyze and interpret reactions to the characteristics of foods and materials as they are perceived by the senses. Humans are used in much the same way a scientist might use a gas chromatograph. It is the conscious effort to identify and judge different sensations and components in an object, be it a piece of food, a beverage, or a perfume. Sensory evaluation encompasses all of the senses. It takes into account several different disciplines but emphasizes the behavioural basis of perception. It involves the measurement and evaluation of sensory properties of food and other materials. Human judges are used to measure the flavor or sensory characteristics of food. In short, sensory evaluation is a very "Gestalt" approach to product assessment.

Sensory evaluation has had a long and active relationship with the food industry. Most of the earliest work on methods development and applications was supported by the industry, which came to appreciate the relationship between a product's sensory characteristics and market success. Over the past three decades sensory professionals made considerable strides in achieving acceptance from its scientific peers. A variety of misconceptions and myths about sensory evaluation had to be challenged; including, for example, the traumas of organolepsia and triangulation (both diseases of the mind) and the tyranny of experts (tongue, nose, etc.) stating what to perceive, what to call the perceptions, and what the consumer would like. With increased acceptance by their peers,

sensory professionals were able to participate in the product decision making process, as well as provide procedures for marketing and quality oriented tests. In more recent years, however, these gains have become in danger of being lost with the re-emergence of experts; the proposition that people can be trained to be invariant; sameness testing a curious but flawed concept that posits that products not perceived as different must be the same, as if products ever are the same; universal scales; and the use of statistical terrorism; e.g., using complex algorithms as a substitute for a well organized and fielded test. (Stone, H., 2006). He further explained that it is a science that measures, analyzes, and interprets the reactions of the senses of sight, smell, sound, taste, and texture (or kinesthesia) to products. It is a people science; i.e., people are essential to obtain information about products. With that product information in hand, business decisions are made often with major economic impact. This people testing process may seem simple enough; however, there are numerous ways by which one goes about deciding who in the population will participate, how they will be tested, and what kinds of questions will be asked. Much research has been done to understand consumer behavior and there is no doubt much more will be done before we have a better understanding of consumer choice behavior. In this work, one regularly encounters myths about consumer behavior that defy established knowledge about the anatomy and physiology of the senses and observed response behavior. One of these myths is the proposition that consumers can be trained to be invariant. Subjects providing the same response each time a specific stimulus is presented is used as evidence of the validity of this approach, where as it is confusing reliability with validity and using a form of behavior modification to fool us

into thinking that individuals trained to provide the same response to a stimulus is realistic response behavior (Stone, H., 2006)

This information is obtained by asking specific questions about a person's age, sex, geographic location, nationality, religion, education and employment along with their preferences on the product being tested. To put it more simply, it stereotypes user groups based on these variables and learns the preferences of particular groups' eating habits. Of course this is not done because of prejudicial motivation, but simply because consumer preferences tend to be very grouped based on such factors listed above. This type of testing is a very accurate tool in understanding consumer preferences (Bopp, P. 1997).

### Perception

Paredes, H. (2007) cited that personality is internal in which both experiment and behavior related in an orderly way. Uniqueness arises from heredity and our experiences. And perception receives information through the senses: sight, taste and hearing. Inputs information is the sensation received through the sense organs. When we hear advertisement, see friend and taste a product.

According to, Gould, J., (1990- 2003) sensation precedes perception and is the process whereby our sensory receptors receive, transduce, and code stimulus information into electrochemical impulses in our nervous system; it is the initial, relatively simple process of detecting individual stimuli. Where perception is the subsequent selection, organization, and interpretation of sensory input, it is the process of obtaining information about both the external and internal environments, which results, via

integration utilizing memory, in the conscious experience, recognition, and interpretation of objects, object relationships, and events.

### Consumer Testing

Consumer testing is a tool used to try to answer questions about the success of a new product. Although there are many different types of consumer tests, the Affective Test is the most popular for basic consumer testing of food. Affective tests, when done properly. Allow different treatments to be judged to find the optimum accepted product. In addition, other Break the masses of consumers down into smaller groups to allow an understanding of who will assess the market share potential for the new product (Bopp, P.A., 1997).

### Acceptability

O'Mahony, M., (1995), stated that food acceptability is often referred to as liking, preference, enjoyment, selection and consumption of a food or drink or food quality. Food acceptability represents different forms of behavior to food products. It is therefore vital that the objective of any Consumer study is clearly defined in advance and the experimental design and questionnaires are carefully designed. For example, "How much do you like" is not the same as "how much do you eat" because consumption is influenced by price, availability, whether the consumer is on a diet etc. The selection and choice of food by an individual are determined by factors resulting from both the food product and the individual.

### Factors to Consider during Sensory Evaluation

Design of experiments, these is where experimental error that have possibility in all experimental work. Error and bias during sensory testing can be minimized through the use of techniques such as of that randomization. Replications also increase the precision of the experiment. She added randomization does two things; it prevents an overlooked effect from becoming identified with an experimental factor, and it ensures that any small overlooked effect is impartially distributed among the comparisons used to judge the methods. Food samples should be evaluated at a temperature at which they are normally consumed (Mabesa, 1986).

### New Product

A product is something that is viewed as capable of satisfying a want. A want is described as state of felt deprivation in a person. This deprivation produces discomfort. The want energizes the person and puts him into an active state- and gives him direction. The person will perceive certain things outside of himself that would satisfy his wants. And maybe this things/want can be could a product (Kotler, P., 1976). He also mentioned that product is anything that can be offered to a market for attention, acquisition, use, or consumption that might satisfy a need or a want (Kotler, 1989).

Stanton, W., (1977), categorizes new product as a) product which are really innovative- truly unique- products which there is a real need but for which there are no existing substitute generally considered satisfactory, b) adaptive replacements of existing products involving a significant differentiation in the existing article, c) Imitative

products which are new to your company but not new to the market. Your firm simply wants to enter that existing market with essentially a “me too” product.

### Sensory Attributes of Food

Sensory attributes of food are detected by all our senses as is illustrated

in the following diagram.

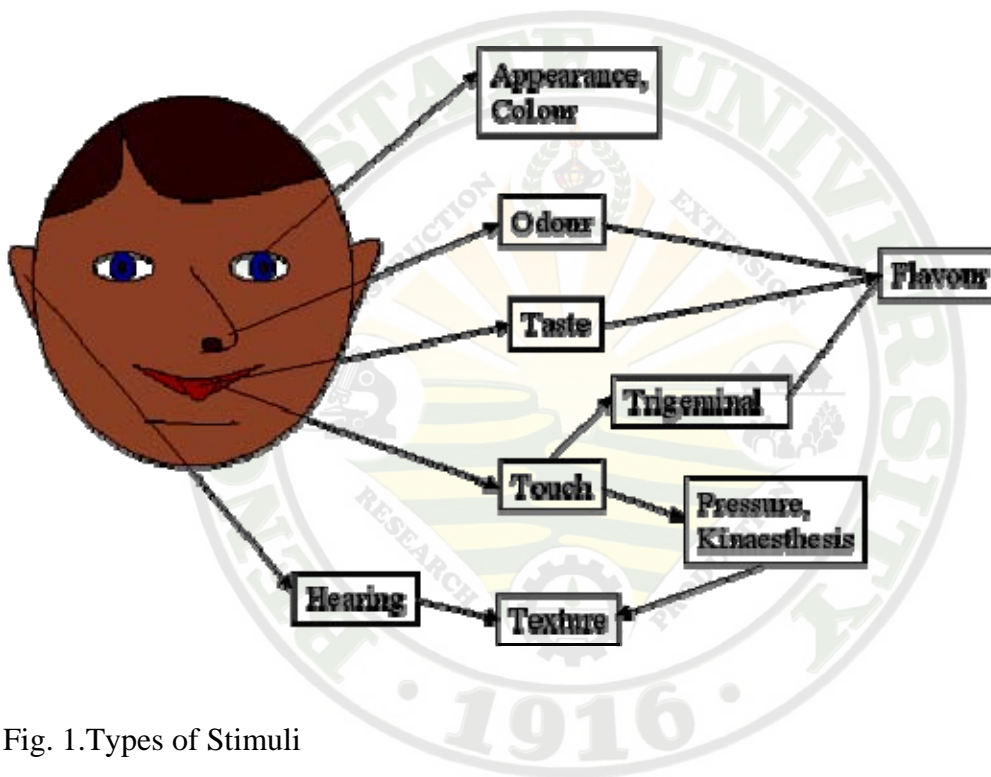


Fig. 1.Types of Stimuli

### The Marketer

The marketer must determine if a) there is a need for a product or services; b) those with a need are interested in buying the product or services; c) these consumers have enough money; and d) those with enough money are willing to spend it on the product or services (Kinnear and Benrhardt, 1986).

## Market Testing

Market is an open frontier, full of hopes and expectations for new business, products and services. It can be a dangerous place for someone who has never experienced the excitement and possible pit-falls of commerce. Thousands of inventors test their product on the market every year, only to find the journey too treacherous. To truly become product-smart, the inventor must test the market. Testing the market is to understand customers, pricing, barriers to entry, and competitors gives the inventor a better shot at making their trip market a success, Anonymous (2006) as cited by (Lumadew, 2007).

### Definition of terms

Acceptability- is referred to as liking, preference, enjoyment, selection and consumption of a quality food.

Consumer testing- tool used to try to answer questions about the success of a new product or through market testing.

Marketer- one who is selling or supplying a product to the market

Market testing- is testing the target market or consumers and promoting a new product whether it is acceptable to the market.

New product- is an innovative product that is new to the market that capable for satisfying a want.

Perception- it is a perceive stimuli (thoughts, idea, reaction and awareness) of consumer in the acceptability of a product.



Sensory evaluation- is a tool used to evaluate quality of food or a certain new product by the use of our senses i.e. taste, smell, touch, sight and hearing.



## **METHODOLOGY**

### Locale and Time of the Study

Sensory evaluation of different formulation of fish patty was conducted at La Trinidad, Benguet. This was done last December, 2007 to January, 2008. For sensory evaluation it was conducted in three locations only; one Poblacion La Trinidad Benguet, Km. 5 Public Market and Benguet State University Campus. The market testing of the chosen product formulation was conducted also in the same locations where sensory evaluations were done.

### Respondents of the Study

The respondents of the study were the residents of La Trinidad, Benguet, specifically high school and college students, faculty/ employees and other consumers. The panelist or product evaluators were determined as to their age and profession. For sensory evaluation of different formulations panelist were composed of 20 panelists from Poblacion, La Trinidad, 20 panelist from Benguet State University campus, and 10 panelists from Km. 5 Public Market these panelists or evaluator were chosen randomly. For the market testing, the same locations were chosen for testing the market acceptability of the product.

### Data Collection

Scorecard or evaluation sheet was prepared as a tool in gathering the data for sensory evaluation the panelists were given samples of the different formulations and

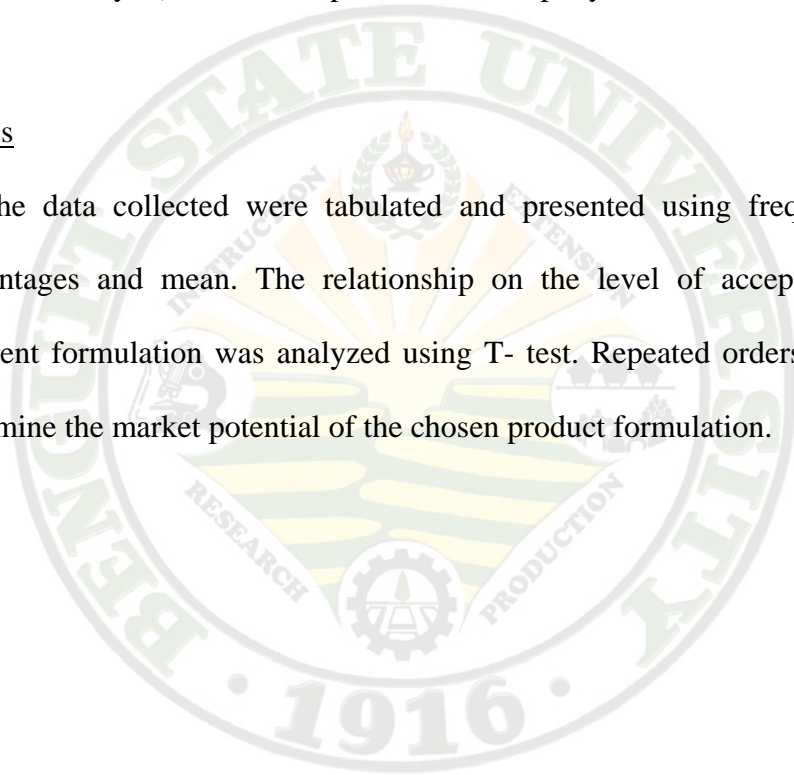
made a taste test and rate the products based on their sensory perception. The accepted formulation was tested in the market with the used of market testing data sheet.

### Data Gathered

The data gathered included the following; primary: a) Consumers acceptability as to their sensory evaluation on fish patty, b) the level of acceptability on different product formulation, secondary: c) and market potential of fish patty.

### Data Analysis

All the data collected were tabulated and presented using frequency counts, percentages and mean. The relationship on the level of acceptability of the different formulation was analyzed using T- test. Repeated orders were used to determine the market potential of the chosen product formulation.



## **RESULT AND DISCUSSION**

### Product Description

There were two product compositions of fish patties that were developed. These are the “formulation A” which composed of 70% of fish tuna and 30% other ingredients and spices, and “formulation B” which composed of 50% fish tuna and 50% other ingredients.

### Age and Types of Respondents

There were 50 respondents who evaluated the product formulations and they are determined as to their age and what types of consumers; this are the students and non-students. Results showed from (Table 1) that most (48%) of the panelist who evaluated the product belonged to the age range from 13- 24 years old. This is followed by 26% which is 25-37 years old, twenty percent belonged to 38- 49 years old and 6% of the panelist were 50 years old and above.

Evaluators/ panelist were determined also classified into students and non-students (Table 1) presents that (48%) of the evaluators were high school and colleges students and 52% were non- students. These included school employees, house wives and other consumers.

Table 1. Age and types of product evaluators/ panelists

PARTICULAR	FREQUENCY (F)	PERCENTAGES (%)
a. Age		
13- 24	24	48
25- 37	13	26
38- 49	10	20
50- Above	3	6
<b>TOTAL</b>	<b>50</b>	<b>100</b>
b. Types of consumers		
Students (College and High School)	24	48
Non- Students (Employees, House wives, and Other consumers)	26	52
<b>TOTAL</b>	<b>50</b>	<b>100</b>

### Sensory Evaluation of Fish Patties

Sensory evaluation was done to evaluate the acceptability of the two product formulation based on taste, appearance, aroma, texture, including its general acceptability, price affordability and the packaging of the product.

### Acceptability as to Taste Evaluation

Taste was evaluated according to the good composition or combinations of the product formulation, result showed (Table 2) that most (30%) of the respondents indicated that they like the formulation A very much. There were 28% who mentioned that they extremely like the product formulation while 26% said that they like moderately, and 12% said they like slightly and one respondent each mentioned neither like nor dislike and dislike slightly the formulation A.

For product formulation B, 20% of the respondents mentioned they extremely like the product, 42% like very much, 30% like moderately and only 8% like slightly. None of the respondents mentioned neither like nor dislike the formulation. Most of the panelist also said that the taste of both formulations were delicious and taste good.

The computed mean for product formulation A was 2.36 which are interpreted as like very much and for product formulation B was 2.26 and the same as like very much by the panelist in term of taste. Statistical analysis using T- test showed that there is no significant differences in the taste of the two product formulations. This implies therefore that the two product formulations have the same taste according to the evaluation of the panelist. Thus the null hypothesis that acceptability of taste between the two formulations has no significant differences is accepted.

Table 2. Panelist rating on the taste of the two formulations/ compositions of fish patties

RATING	PRODUCT FORMULATIONS			
	Formulation A		Formulation B	
	F	%	F	%
1. Extremely like	14	28	10	20
2. Like very much	15	30	21	42
3. Like moderately	13	26	15	30
4. Like slightly	6	12	4	8
5. Neither like nor dislike	1	2	-	-
6. Dislike slightly	1	2	-	-
7. Dislike moderately	-	-	-	-
8. Dislike very much	-	-	-	-
9. Dislike extremely	-	-	-	-
TOTAL	50	100	50	100
MEAN		2.36		2.26
Rating Scale	0.23 (ns)			
1- Extremely Like	9- Dislike Extremely		ns- No significant	

### Acceptability as to Appearance Evaluation

Acceptability of the appearance was referred to the size, shape and color of the product (Figure 2). Both formulations have the same shape and size. Both are round shape and weighed for 27.5 gms. per piece patty, the only difference is there colors. “Formulation A” have a darker or brownish color, while “Formulation B” have a lighter or light brown and dotted with green particles (green leaves of chives) or appeared like a veggie patty.

In terms of color indicator, (Table 3) shows that 14% of the panelist rated Formulation A as extremely like, 40% as like very much, 34% like moderately and 10% as like slightly. No one among the panelist who evaluates the formula as neither like nor dislike.

Formulation B was evaluated by 14% of the panelist as like extremely, most (44%) said that they like very much, 30% rated like moderately, 12% also said that they like slightly the formulation and no one rated as dislike slightly.

The computed mean of the two formulations was 2.46 for formulation A which is interpreted as like very much while 2.4 for formulation B and interpreted also as like very much by the panelist. Statistical analysis using T- test on the level of acceptability showed that both appearances of the two formulations have no significant differences. Thus the null hypothesis that the acceptability of the two formulations as to the appearance has no significant difference is accepted.

Table 3. Panel rating on the appearance of the two formulations of fish patties

RATING	PRODUCT FORMULATIONS			
	Formulation A		Formulation B	
	F	%	F	%
1. Extremely like	7	14	7	14
2. Like very much	20	40	22	44
3. Like moderately	17	34	15	30
4. Like slightly	5	10	6	12
5. Neither like nor dislike	1	2	-	-
6. Dislike slightly	-	-	-	-
7. Dislike moderately	-	-	-	-
8. Dislike very much	-	-	-	-
9. Dislike extremely	-	-	-	-
TOTAL	50	100	50	100
MEAN		2.46		2.4
Rating Scale	0.11 (ns)			



Fig. 2. Samples of the two formulations



### Acceptability as to Aroma Evaluation

The acceptability of aroma for formulation A result showed that extremely like was evaluated by 18% of the panelist, while 44% said that they like very much , 26% also evaluated as like moderately, 10% as like slightly, and one respondent (2%) said neither like nor dislike the aroma of the formulation.

The evaluation for formulation B, showed that 10% of the panelist evaluated the aroma as extremely like, 36% as like very much and most (40%) said that they like moderately. Some (8%) respondents rated the formulation as like slightly and 4% said that they neither like nor dislike the formulation (Table 4). The result obviously shows that most of the panelist preferred the aroma of formulation A, may be because of the higher percentages of fish tuna composition.

The computed mean for formulation A was 2.34 which is interpreted as like very much and 2.36 was computed for formulation B and interpreted also as like very much by the panelist. Statistical analysis showed that there is no significant difference on the aroma. Thus the null hypothesis that the acceptability of panelist in terms of aroma has no significant differences is accepted.

Table 4. Panel rating on the aroma of the two formulations of fish patties

RATING	PRODUCT FORMULATIONS			
	Formulation A		Formulation B	
	F	%	F	%
1. Extremely like	9	18	5	10
2. Like very much	22	44	19	38
3. Like moderately	13	26	20	40
4. Like slightly	5	10	4	8
5. Neither like nor dislike	1	2	2	4
6. Dislike slightly	-	-	-	-
7. Dislike moderately	-	-	-	-
8. Dislike very much	-	-	-	-
9. Dislike extremely	-	-	-	-
TOTAL	50	100	50	100
MEAN		2.34		2.36
Rating Scale	0.02 (ns)			

#### Acceptability as to Texture Evaluation

Texture of the product refers to the fineness and tenderness of the two formulations as to the mouth feel of the panelist. Formulation A results showed that most (34%) of the panelist like very much the texture, followed by like moderately as evaluated by 30% of the respondents and 22% as extremely like the formulation. However, 12% of the respondents said that they like slightly and one respondent (2%) evaluated as neither like nor dislike the texture.

For formulation B, most (38%) of the panelist evaluated the formulation as like very much, 32% as like moderately, and 18% said that they extremely like the

formulation. Some of the panelist (6%) evaluated as like slightly, 4% neither like nor dislike and one respondent (2%) dislike slightly the texture of the formulation.

The mean ratings for the two formulations as to texture was 2.38 for formulation A and 2.46 for formulation B and both formulations were interpreted as like very much by the panelist. Statistical analysis using T- test showed no significant differences between the two means. This implies that both product formulations are similar in texture. Thus the null hypothesis that acceptability between the two formulations as to the texture has no significant difference is accepted.

Table 5. Panel rating on the texture of the two formulations of fish patties

RATING	PRODUCT FORMULATIONS			
	Formulation A		Formulation B	
	F	%	F	%
1. Extremely like	11	22	9	18
2. Like very much	17	34	19	38
3. Like moderately	15	30	16	32
4. Like slightly	6	12	3	6
5. Neither like nor dislike	1	2	2	4
6. Dislike slightly	-	-	1	2
7. Dislike moderately	-	-	-	-
8. Dislike very much	-	-	-	-
9. Dislike extremely	-	-	-	-
TOTAL	50	100	50	100
MEAN		2.38		2.46
Rating Scale	0.14 (ns)			

### General Acceptability Evaluation of the Two Formulations

The criteria in judging general acceptability was based on the general perception / rating of the evaluators as to the taste, appearance, texture, aroma and including the packaging of the product. Comparing the two formulations, result showed (Table 6) for formulation A that 42% of the panelist like very much the formulation, followed by like moderately as evaluated by 30% evaluators, 18% evaluators responded as extremely like and 8% said that they like slightly, while one of the respondents said neither like nor this like the formulation.

For formulation B, most (50%) of the respondents said they like very much the product, 22% said that they like moderately, and the same with formulation A that 18% of the panelist rated as extremely like the formulation and only 4% evaluated as like slightly while one (2%) of the respondent rated as dislike very much.

The computed mean of the two formulations was, 2.34 for formulation A and 2.36 for formulation B and both formulations were interpreted as like very much by the respondents. Statistical analysis using T- test showed that the level of acceptability between the two formulations has no significant differences. Thus null hypothesis that acceptability between the two formulations as to general acceptability has no significant differences is accepted.

Table 6. Panel rating on the general acceptability of the two formulations of fish patties

RATING	PRODUCT FORMULATIONS			
	Formulation A		Formulation B	
	F	%	F	%
1. Extremely like	9	18	9	18
2. Like very much	21	42	25	50
3. Like moderately	15	30	11	22
4. Like slightly	4	8	2	4
5. Neither like nor dislike	1	2	-	-
6. Dislike slightly	-	-	-	-
7. Dislike moderately	-	-	-	-
8. Dislike very much	-	-	1	2
9. Dislike extremely	-	-	-	-
TOTAL	50	100	50	100
MEAN		2.34		2.36
Rating Scale	0.01 (ns)			

#### Panel/ Evaluators Acceptability as to the Packaging of the Product.

Panelists were given two types or sample of packaging that was used in rating the product (figure 3). The evaluators were also asked to suggest some types of packaging materials which they think is appropriate for the product. The two samples of packaging are “Packaging A”, the medium used was 4.5” x 6.5” styrofoam noodle box and “Packaging B” was used of 4” x 4” styrofoam spaghetti box. Results shows that “Packaging A” is most preferred by 74% of the panelist followed by “Packaging B” was least preferred by 18% of the panelist. As shown in Table 7, 4% of the panelist suggested plane plastic and some panelist (4%) preferred Styrofoam cup as a medium to be used as packaging material of the product.

Most of the panelist gave their comments on the packaging of the product especially on the labelling, complete information of nutrition facts, ingredients, used of the product and its life span. They further suggested that the label should not cover the product.

Table 7. Panels rating on the acceptability of packaging

SAMPLE PACKAGING AND SUGGESTIONS	LEVEL OF ACCEPTABILITY	
	F	%
Packaging A	37	74
Packaging B	9	18
Suggestions:		
a) Plane plastic	2	4
b) Styrofoam cup	2	4
TOTAL	50	100

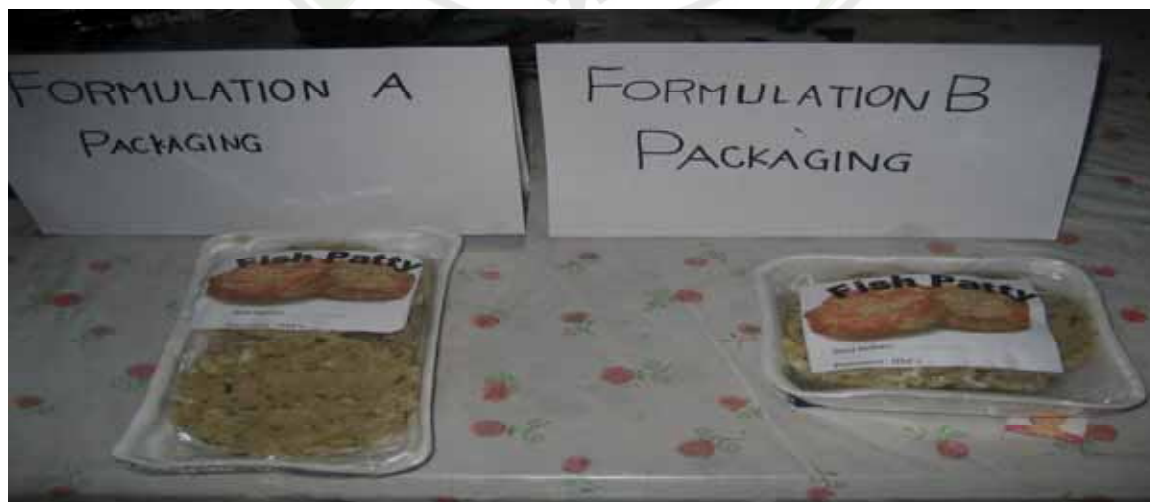


Figure 3. Sample packaging of the product

### Panelist Rating on the Given Sample Price

Product price were evaluated in order to measure the acceptability and affordability by the consumers. The given sample price of the product was P5 per piece or P50 per pack. The acceptability of the panelist was shown in Table 8. Most (96%) of the respondents evaluated the product price per piece as affordable, while 4% said that it is not affordable. The P50 per pack was affordable to 92% of the panelist. There were 8% who said that the product price is not affordable.

The panelists were also asked to suggest price that are affordable to them. This information was used to find out the affordability of the product in the market. Table 8 present that 4% of the panelist suggested P6 per piece, while some (2%) suggested P7 per piece as affordable. The finding shows that P5 per piece or P50 per pack is affordable to the consumers.

Table 8. Sample price during sensory evaluation

PARTICULAR	PERCENTAGES OF PRICE ACCEPTABILITY			
	Affordable		Not Affordable	
	F	%	F	%
a) Price per piece and per pack				
P5 per piece	48	96	2	4
P50 per pack	46	92	4	8
b) SUGGESTED PRICE PER PIECE				
		F		%
P6		2		4
P7		1		2

Market Testing/ Acceptability of the Product  
(Chosen Formulation)

Market testing was done to measure the acceptability of the product to the target market or consumers as to the price of the product per packed, improved packaging, the willingness to repeat the order, and what specific consumers could buy and afford the product, based on retailer and marketer observations.

Product acceptability was done in specific locations at La Trinidad, Benguet, and where sensory evaluation was done. There were 16 consumers/buyers who evaluated the product, 1 stall was supplied at Km. 5 (Public Market), and the marketer also does individual selling to 10 consumers at Km6, Benguet State University and 5 house hold consumers at Poblacion La Trinidad, Benguet. The product formulation tested in the market was that of "Formulation B" (50%: 50%), which is most preferred by the product evaluators.

Target market acceptability as to the market price. Target consumers were given a situation on price increase, in which if the price was P55 in the market, and if the price increases to P58 and P60. Result shows (Table 9) that if the price is P55 in the market 68.75% of the consumers rated the product price as affordable while 31.25% said that it is not affordable. But if the price will increases to P58, most (62.5%) of the consumers said that the product is not affordable, the same if the price increases to P60, 81.25% of the consumers rated the product price as not affordable. This findings implies that if the price of the fish patty will increase a little, majority of the consumers would not be able to afford it.



Table 9. Consumers rating on the acceptability of different prices

PRICES	PERCENTAGE OF PRICE ACCEPTABILITY			
	Affordable		Not affordable	
	F	%	F	%
P55	11	68.75	5	31.25
P58	6	37.5	10	62.5
P60	3	18.75	13	81.25

Consumers behavior in buying the product. Consumers behavior as to how often they buy the product incase it is available in the market including the quantity that they will buy was analyzed. There were sixteen (16) regular buyers who were asked about the affordability of the product. Eleven or 68.75% said that P55 per pack is affordable and 31.25 said it is not affordable and 62.5% said it is not affordable when the price was raised to P60 per pack, the number of respondents who said the price is affordable decreased to only 18.75%.

The respondents were further asked how often they will buy the product per week and the quantity they will buy when the price is P55, P58 and P60. The result shows that if the price is P55, majority (68.75) of the respondents would buy once a week at most two packs. One of the respondents would buy 2 packs twice a week if the price is P55.

When the price was increased to P58 per pack, only 7 respondents would buy once a week. Majority of them would buy only one pack. One of the respondents would still buy twice a week but the quantity would decrease from 2 packs to one pack.

When the price was further increased to P60, the number of the respondents willing to buy the product further decrease to only five (5). Further more, the respondents who would buy twice a week reduced to only once a week. This finding shows that the P60 per pack is not affordable to many of the consumers.

Table 10. Frequency and volume purchase at different set of prices

PARTICULAR	FREQUENCY (F)	PERCENTAGES (%)
a) How often to buy and how many pack/s to buy?		
<u>P55:</u>		
Once a week	11	68.75
1 pck	3	18.75
2 pcks	3	18.75
Twice a week	1	6.25
2pcks	1	6.25
(Others:)		
Twice a month	1	6.25
2 pcks	1	6.25
<u>P58:</u>		
Once a week	7	43.75
1pck	6	37.50
2 pcks	1	6.25
Twice a week	1	6.25

Table 10 continued...

<u>P60:</u>		
Once a week	5	31.25
1pck	3	18.75
2pcks	1	6.25

Target market acceptability as to the improved packaging of the product.

Improved packaging refers to the attractiveness and labelling acceptability of the consumers. Packaging was shown in Figure 4. Materials used were 4.5” x 6.5” styrofoam noodle box and 3.5” x 3.5” plastic in between each patty and the product was covered with a cling wrapper. Packaging also includes product labelling and product information as to shelf- life.

The result shows that 75% of the consumers accepted the product packaging. One or (6.25%) each suggested the use of indigenous materials such as (banana leaves), and plastic container (Table 11). Result implies that consumers accepted the packaging material however more improvements were suggested for safety purposes of the product.

Table 11. Consumers acceptability of the improved product packaging

PARTICULAR	FREQUENCY (F)	PERCENTAGE (%)
Acceptable	12	75
Not Acceptable	2	12.5
Suggestions:		
Indigenous materials	1	6.25
Plastic container	1	6.25
TOTAL	16	100



Fig. 4. Sample of the improved packaging

Consumers willingness to repeat the order. Consumers willingness to repeat the order was based on the observations of the marketer. According to the marketer, many consumers like the product and are willing to repeat the order however; most of them are price conscious. Most who repeated the order are those who have jobs or being

employed, and those who have knowledge on the benefits they got from the product.

These were the consumers who are health conscious. Although students like the product but their affordability to buy the product is low. Almost 50% of the consumers repeated the order with the price of P50 and P55, while others do not repeat the order because they either did not like the product, want to see more improvement on the product or can not afford the price.



## **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### Summary

The study was conducted to evaluate the acceptability of fish patty by target consumers based on the characteristics of the product. Thus, this study aimed to determine what fish patties product formulation is the most acceptable to the consumers/panelist, determine the level of consumers acceptability on the different formulation of fish patties, and to determine the market potential of the most preferred formulation by the panelist.

Two formulations were developed and used for sensory evaluation by doing taste test. Formulations were composed of a) 70% fish tuna and 30% other ingredients and spices, b) 50% fish tuna and 50% other ingredients and spices. The panelist/ evaluators were selected through random sampling. Evaluators were classified as students and non-students. Product testing was done only in three locations at the La Trinidad, Benguet; Km5 public Market, Benguet State University campus, and at Poblacion (San Jose high school) la Trinidad, Benguet because of time and financial constraints. There were 50 respondents who evaluated the product.

Both formulations were rated by the panelist as to the taste, aroma, texture, appearance, general acceptability including the size and packaging of the product. Results showed that “Formulation B” is the most preferred by evaluators/ panelists. Except for the aroma which is 44% of the panelist was preferred “Formulation A” and rated as like very much. While formulation B was rated as like moderately by 40% of the panelist/ evaluators. Statistical analysis shows that the level of acceptability of the two product

formulations as to the taste, aroma, texture, appearance and the general acceptability did not significantly. Thus the null hypothesis that acceptability between the two formulations as to the taste, aroma, texture, appearance, and the general acceptability of the product has no significant differences is accepted. As to the packaging material of the product, the most preferred by the 74% of the panelists was that of “Packaging A” (Figure 3). The medium used was 4” x 6” spaghetti box styrofoam covered with cellophane.

Market testing was conducted in the same locations, Km5 (public Market), Benguet State University campus and at Poblacion (San Jose high school) la Trinidad, Benguet. The formulation being tested in the market was the most preferred by the panelist which was the “Formulation B” composition. Results shows that most of the consumers like the product, and most of them said that the taste was good, it’s a healthy product and delicious.

Acceptability as to the improved packaging were accepted by 75% of the target market, but most of the consumers comments was to improved more on the nutritional facts or show the nutrient content of the product.

On the price acceptability, 92% of the consumers said that the product is affordable if the price is P50; this is followed by (69%) consumers can afford product if the price is P55 in the market. But if the price increases to P58 and P60, most of the consumers cannot afford the product price. Consumers also show their behavior on how often they buy the product with the different price. Result shows that most (68.75%) of the consumers buy ones a week only.

Product acceptability in the market was based on repeat order of the consumers. Result shows that most of the consumers repeated the order with the price of P50 and P55. Most of those who repeated the orders were employed, health conscious and those who have enough money.

### Conclusion

The following conclusions were based on the findings of the study:

1. The fish patty did not differ in terms of taste, aroma, texture, appearance and general acceptability as evaluated by the panelist/ consumers.
2. The type of packaging accepted by majority of the consumers was the 4.5” x 6.5” Styrofoam noodle box.
3. The price of P50/ pack or P5 per piece was affordable to majority of the consumers/ panelist but P58 and P60 per pack is not affordable to most of the consumers.
4. The product has market potentials as indicated by repeated orders from majority of the consumers.

### Recommendation

1. Since the two product formulation did not differ significantly in terms of acceptability by the consumers, the manufacturer should choose the formulation which the lower cost of production.



2. Although the packaging presented to the respondents was acceptable to majority. Innovations should be done to keep the cost low but maintain the good product quality.
3. Since majority of the consumers could not afford P60 per pack the manufacturer should keep the cost of production to keep the price also low. This possible through increase volume of production so that the fixed cost would be diffused.



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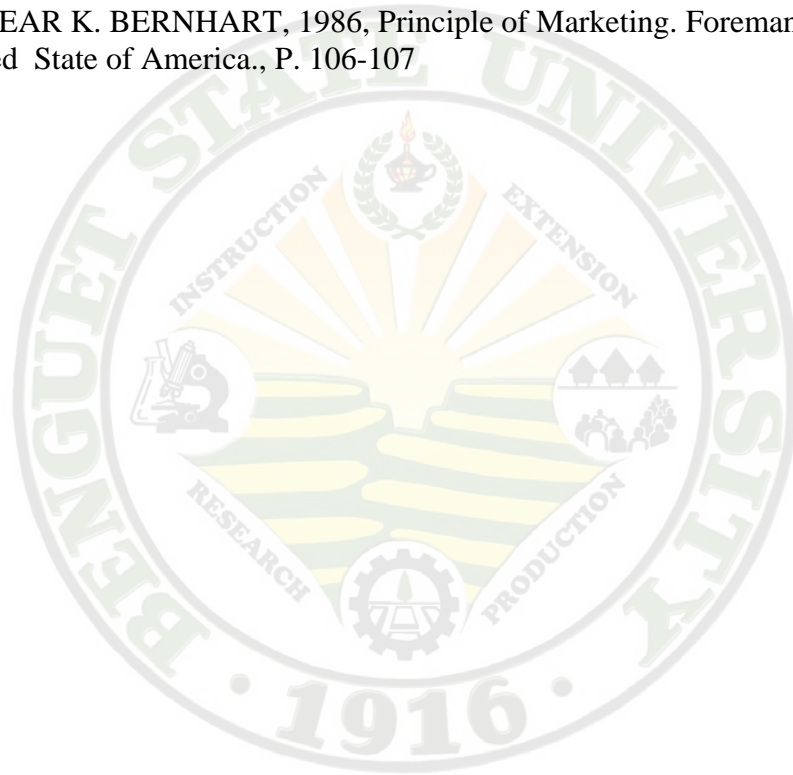
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## QUESTIONNAIRE

### Sensory Evaluation Sheet

Name (Optional) \_\_\_\_\_ Date \_\_\_\_\_

Profession \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_ Product \_\_\_\_\_

Instruction: Taste test the given samples and check how much you like or dislike the products. Use the appropriate scale to show your attitude by checking the point in the scale which best describes your feeling. Take a drink of water after each product tasted.

### Hedonic Scaling

#### Formulation A

Rating	Taste	Aroma/ Odor	Appearance/ color	Texture (mouth feel)	General Acceptability
1. Like Extremely					
2. Like very much					
3. Like moderately					
4. Like slightly					
5. Neither like or dislike					
6. Dislike slightly					
7. Dislike moderately					
8. Dislike very much					
9. Dislike extremely					

## Formulation B

Rating	Taste	Aroma/ Odor	Appearance/ color	Texture (mouth feel)	General Acceptability
1. Like Extremely					
2. Like very much					
3. Like moderately					
4. Like slightly					
5. Neither like or dislike					
6. Dislike slightly					
7. Dislike moderately					
8. Dislike very much					
9. Dislike extremely					

1. Price \_\_\_\_\_; \_\_\_\_\_ Affordable; \_\_\_\_\_ Not Affordable

Suggested Price \_\_\_\_\_

\* If the product will be available in the market at P \_\_\_\_\_ are you willing to buy?

\_\_\_\_\_ Yes; \_\_\_\_\_ No

2. Is the size acceptable to you? \_\_\_\_\_ Yes; \_\_\_\_\_ No; If not what size do you like?

\_\_\_\_\_ make it bigger; \_\_\_\_\_ smaller?

3. Choose packaging of the product \_\_\_\_\_ packaging A; \_\_\_\_\_ packaging B? If none what do you like? Using

\_\_\_\_\_; plane plastic/ cellophane

\_\_\_\_\_; Styrofoam cup

\_\_\_\_\_; plastic cup

\_\_\_\_\_; others Pls. specify?

Comments \_\_\_\_\_

## MARKET TESTING DATA SHEET

Outlet \_\_\_\_\_

For retailers only.

DATE OF OBSERVATION	QUANTITY	PRICE	SIZE/ NET WT.	SALES TURNOVER
		P55	300 gms.	
		P55	300 gms	
		P55	300 gms	
		P55	300 gms	
		P55	300 gms	

Price:

1. Is the price P55 affordable to you? \_\_\_\_ Yes, \_\_\_\_ No. If yes, how many packs do you want to buy?

\_\_\_\_ 1 pck. \_\_\_\_ 2 pcks. \_\_\_\_ other please specify?

And how often do you want to buy? \_\_\_\_ everyday \_\_\_\_ twice a week, once a week, \_\_\_\_ other please specify?

2. Is the price P58 affordable to you? \_\_\_\_ Yes, \_\_\_\_ No. If yes, how many packs do you want to buy?

\_\_\_\_ 1 pck. \_\_\_\_ 2 pcks. \_\_\_\_ other please specify?

And how often do you want to buy? \_\_\_\_ everyday \_\_\_\_ twice a week, once a week, \_\_\_\_ other please specify?

3. Is the price P60 affordable to you? \_\_\_\_ Yes, \_\_\_\_ No. If yes, how many packs do you want to buy?

\_\_\_\_ 1 pck. \_\_\_\_ 2 pcks. \_\_\_\_ other please specify?

And how often do you want to buy? \_\_\_\_ everyday \_\_\_\_ twice a week, once a week, \_\_\_\_ other please specify?

Packaging:

1. Is the improved packaging acceptable to you? \_\_\_\_ yes, \_\_\_\_ No? If no \_\_\_\_\_ pls. specify some medium of packaging to be use?

\* Who has the higher of your customer or buyers of fish patties product? Pls. Check!

\_\_\_\_ Students \_\_\_\_\_ Parents and other household consumers?

\_\_\_\_ Yuppies (Single and employed)

\* Are you willing to repeat the order? If yes how many pack/s \_\_\_\_\_ pls. specify?

Comments; \_\_\_\_\_  
\_\_\_\_\_

## STATISTICAL ANALYSIS (T- TEST) COMPUTATION

1) One way score group [fweght=taste], tabulate nofreq

Summary of score						
Compositions	Mean	Std. Dev.				Obs.
Formulation A	2.36	1.1911236				50
Formulation B	2.26	.87621636				50
<b>Total</b>	<b>2.31</b>	<b>1.0415121</b>				<b>100</b>
Source	SS	Analysis of Variance		F	Prob > F	
		df	MS			
Between groups	.25	1	.25	0.23 (ns)	0.6336	
Within groups	107.14	98	1.09326531			
<b>Total</b>	<b>107.39</b>	<b>99</b>	<b>1.08474747</b>			
Bartlett's test for equal variances:		chi2 (1) = 4.5026	Prob > chi2= 0.034			

2) Oneway score group [fweght=aroma], tabulate nofreq

Summary of score						
Compositions	Mean	Std. Dev.				Obs.
Formulation A	2.34	.96065454				50
Formulation B	2.3625	.78343208				50
<b>Total</b>	<b>2.3538462</b>	<b>.85237051</b>				<b>100</b>
Source	SS	Analysis of Variance		F	Prob > F	
		df	MS			
Between groups	.015576923	1	.015576923	0.02 (ns)	0.8843	
Within groups	93.7075	128	.732089844			
<b>Total</b>	<b>93.7230769</b>	<b>129</b>	<b>.72653548</b>			
Bartlett's test for equal variances:		chi2 (1) = 4.5026	Prob > chi2= 0.034			



## 3) One way score group [fweght=appearance], tabulate nofreq

Summary of score					
Compositions	Mean	Std. Dev.			Obs.
Formulation A	2.46	.93043769			50
Formulation B	2.4	.880663057			50
Total	2.43	.90179395			100
Source	SS	df	MS	F	Prob > F
Between groups	.09	1	.09	0.11 (ns)	0.7412
Within groups	80.42	98	.820612245		
Total	80.51	99	.813232323		
Bartlett's test for equal variances:		chi2 (1) = 0.1467	Prob > chi2= 0.702		

## 4) One-way score group [fweght=texture], tabulate nofreq

Summary of score					
Compositions	Mean	Std. Dev.			Obs.
Formulation A	2.38	1.027976			50
Formulation B	2.46	1.1104329			50
Total	2.42	1.0653401			100
Source	SS	df	MS	F	Prob > F
Between groups	.16	1	.16	0.14 (ns)	0.7093
Within groups	112.2	98	1.14489796		
Total	112.18	99	1.13494949		
Bartlett's test for equal variances:		chi2 (1) = 3.729	Prob > chi2= 0.053		

5) Oneway score group [fweight= General Acceptability], tabulate nofreq

Summary of score					
Compositions	Mean		Std. Dev.		Obs.
Formulation A	2.34		.93917028		50
Formulation B	2.36		1.2414606		50
Total	2.35		.0952146		100

Source	SS	Analysis of Variance			F	Prob > F
		df	MS			
Between groups	.01	1	.01		0.01 (ns)	0.9278
Within groups	118.75	98	1.21163265			
Total	118.75	99	1.1994995			

Bartlett's test for equal variances:  $\chi^2(1) = 3.7289$  Prob >  $\chi^2 = 0.053$

