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DEVELOPMENT AND EVALUATION OF TABLEA AND CARABAO'S MILK-BASED CHOCOLATE CONFECTIONS

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ABSTRACT

This research aimed to create and test chocolate confectionery made with TABLEA and carabao`s milk using different sensory properties, nutritive value, cost, and acceptability. The formulations included chocolate spread, chocolate bar, and chocolate truffle. The research used an experimental design with subjects participating in the same trials. The sample included 51 respondents, which included teachers, students, chocolate producers, business owners, and purchasers. Data was collected using the 5-point Hedonic Scale and analyzed using weighted means and One-Way ANOVA.

The results showed that the products were highly accepted by the respondents based on their appearance, smell, taste, and texture. The spread formulation had the highest average scores from the respondents. The nutritional analysis indicated that all formulations were caloric-dense, moderate fat, and low sugar. Shelf-life analysis showed that products were still acceptable for a period of 55 days. Statistical analysis indicated that there was no significant difference between the formulations ($p > 0.05$).

Through this research, it was found that TABLEA and carabao's milk could be utilized effectively to produce acceptable and nutritious chocolate confectionery. A technology package was designed to assist in the development and commercialization of the products produced.

KEYWORDS: *Tablea, Carabao's Milk, Chocolate Confections, Sensory Evaluation, Product Developmen*

1. INTRODUCTION

Tablea is a traditional Filipino cocoa product largely produced in Bohol; however, there is very little usage of Tablea as an ingredient to make chocolate beverages. The same holds true with carabao's milk which contains very rich nutrients but is not commonly used due to lack of knowledge about the taste of carabao's milk and limited number of products that have been made from carabao's milk.

As the market moves toward more sustainable and functional food products, there is a growing opportunity to create innovative food products utilizing ingredients that are produced locally. Both Tablea and carabao's milk have proven to contain antioxidants (Tablea) as well as high levels of protein, fat, and many of the vitamins and minerals required for healthy bones and tissues (carabao's milk).

The purpose of this study was to develop and evaluate three different types of chocolate products, including a chocolate spread, chocolate bar, and chocolate truffle, using Tablea and carabao's milk. To accomplish this, we conducted an examination of the production characteristics of each of the three products as well as their sensory characteristics, nutritional values, shelf life, and consumer acceptability. Furthermore, we compared each of the three products against one another to determine if there were significant differences between each product and prepared a technology package for producing the new products.

Research Design

The Experimental method of study was carried out in a within subject manner that allowed each person to evaluate the three product types.

Locale of Study

The research conducted for this project was done inside Food Technology Laboratory at Danao Technological College in Bohol Philippines.

Respondents

51 people were used as the respondents of the study that represent the following categories of people:

Food Technology Teachers
BTVTed Students
Chocolate Makers
Entrepreneurs
Local Consumers

Sample and Sampling Techniques

To acquire the sample group purposive sampling and snowball sampling procedure use as a method criterion to determine relevance of participant in respect to knowledge and experience in which the individual had pertaining to chocolate production.

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Research Instrument
To evaluate the overall product's acceptability for visual, smell, taste, texture and acceptability, a modified sensory evaluation questionnaire using a 5-point Hedonic Scale was used for analysis and evaluation of the products.

Data Collection
The procedure followed to collect data was:
Preparation of Ingredients and Tools for Production
Production of Products
Sensory Evaluating of Product for Acceptability
In-Lab Testing for Nutritional Analysis
Collecting and Recording Data

Data Analysis Techniques
Means and Weighted Means
One Way ANOVA
Scheffe Test

Ethical Consideration
The study was performed in accordance with proper ethical consideration to respondents. Willingness to participate in this research was voluntary. All respondents were provided with information related to study purpose and confidentiality was maintained throughout the study with compliance of ethical standards of conducting research.

RESULTS AND DISCUSSION

Production Cost Analysis
Results showed production costs for the chocolate bar were higher; however, yield was higher for the truffles. All products were also found to be equal in pricing efficiency; thus, commercializing any of these formulations would be an option.

Sensory Quality Assessment
Each formulation received a “Highly Acceptable” rating in terms of appearance, aroma, taste, and texture, with the chocolate spread consistently receiving the highest score. This suggests that consumers prefer the chocolate spread over other formulations.

Nutritional Value and Shelf-Life Analysis
All formulated products contained a high energy content, primarily from carbohydrates, moderate fat, and low sugar content. All products were acceptable for up to 55 days from the date of production, with increasingly noticeable degradation at 56 days.

Statistical Comparisons of Formulations
The ANOVA statistical test results indicate no significant statistical differences among any of the three formulations ($p = 0.227 > 0.05$), which implies that consumers accepted all formulations equally well.

CONCLUSIONS & RECOMMENDATIONS

The study concluded that both tablea and carabao’s milk are excellent ingredients to produce chocolate-type confections with high acceptability as well as nutritional value. Of the selected formulations, chocolate spread appeared to be favored most by consumers based on raw score; however, all formulations showed consumer acceptance within the same range.

Recommended actions include the commercialization of the developed formulations and technology package by local businesses and/or entrepreneurs. Further studies should include possible modifications of the products including product packaging, and longer shelf-life testing.

Limitations of this study include a limited number of participants in this sensory evaluation study. Future studies should include a broader participant base, a modified product testing methodology, broader included variables at time of testing and extended nutritional analysis.

Ethical Compliance Disclosure
All ethical standards were addressed in this study, including voluntary participation by each subject, informed consent from each subject and confidentiality no conflicts of interests were reported by any of the principal investigators.