

THE DEVELOPMENT OF GREEN PACKAGING FROM BANANA FIBER FOR INSTANT FOOD PRODUCTS

Bussara Soiraya¹ , Chompunuch Phuenpipop² , Duangkamol Thangsatidporn² ,
 Autcha Siripun³ , Praparnporn Theeramongkol³

¹Associate Professor, ² Food Science and Nutrition Program,

³ Fashion Clothing and Textile Design Program,

Faculty of Home Economics Technology,

Rajamangala University of Technology Phra Nakhon

E-mail bussara.s@rmutp.ac.th¹ , autcha_m@hotmail.com³ , Tammy-design@hotmail.com³

Abstract

This research examined the green packaging development from banana fiber for instant food products. The purposes were to construct, approve and develop the sketch design, to develop banana fiber package prototypes that protect food products inside, to eliminate packaging environment problems, prevent natural resource and save energy in package processing, and to design packaging for instant banana food products such as packages such as stand-up pouch, paper box, paper cup, and zip lock paper bag. The research was found that Satisfaction of every factors were good level and every packaging patterns conformed to the identity design in structural and graphical packaging. As a result of studying structural packaging factors, it indicated factors that had excellent satisfaction level in every packaging patterns, were packaging with aesthetic and elegant ones, identity packaging, and souvenir packaging. The least satisfaction for studying graphical packaging factors had excellent satisfaction level such as identity brand alphabet and easier to recognize as follow.

Keywords : green packaging, banana fiber, instant food products

Introduction

Now, Demand of the global food products market, which is a value-added product, is increasing. As a result of the population growth, the global economy and also consumer behavior changing. In Thailand, Packaging industry has developed and expanded. Packaging development has several factors such as reducing production costs and maintaining the quality product to be accepted by consumers. Moreover, There is an important factor, which has direct impact on increasing products sales, is packaging design with graphics. It is suit to utility, beautiful and consumers' habits. After consumption of products and packaging such as cardboard, glass bottles, metal cans to plastic bottles and waste paper and other valuable materials, it was an impact on the environment is unavoidable. The approach led to several problems such as packaging materials reducing, re-used, recycled and using biodegradable packaging and environmentally friendly. However, the researcher realized the environmental problems, so that we choose the Banana fiber to develop as package. It includes both an art combined with science or the technology together. Packaging will work just fine, which depends on the quality of packaging products to protect their safety and using at least material (Reduce) save energy. There is little waste as possible to the environment. It can be transformed into a new (Recycle).

Objectives

1. To study, prepare a draft, Check, improve the draft and prepare prototype of the packaging
2. To develop packaging products from banana fiber able to contain
3. To reduce environmental problems caused by packaging, conserve resources and save energy in the packaging production of the next decade
4. To design the packaging of food products from bananas the development of green packaging from banana fiber for instant food products

Method

This research focuses on the development of green packaging from banana fiber for instant food products. Variables studied in this issue, packaging design of green packaging from banana fiber for instant food products of the envelope (Stand-up pouch), box (Paper Box), paper cups (Paper Cup), paper bags (Zip Lock Paper Bag). In this research, banana fiber used to produce packaging to select the quality of the physical, chemical and consumer product safety. Packaging is recycling-based which is eco-friendly disposal.

1. Tools of experiment

In order to collect and process the following: .1Raw materials in the packaging of banana fiber .2The paper production from banana fiber .3Processing as packaging paper.

2. Sampling group In this research, the samples were divided as follows.

2.1 General population of > 100,000 people.

2.2 Sample of 100people are %10, confidence level of %95 of the Yamane

3. Procedures

3.1 Design & Questionnaire

3.2 packaging design of green packaging from banana fiber for instant food products, including envelopes (Stand-up pouch), box (Paper Box), paper cups (Paper Cup), paper bags (Zip Lock Paper Bag).

3.3 A model and prototype.

3.4 Research Tool, packaging design of green packaging from banana fiber for instant food products by questionnaire. The survey of opinion and divided into two parts as follows.

Part 1 the status of sex, age, occupation, salary and education. In order to compare the data in this study.

Part 2 the questions of the satisfaction level of the development of green packaging from banana fiber for instant food products including envelopes (Stand-up pouch), paper (Paper Box), cups, paper (Paper Cup), paper bags (Zip Lock. Paper Bag) in the packaging structure: Graphics and packaging from the sample group.

3.5 Examine or Questionnaire checking

3.5.1 In this research, 3 connoisseurs to verify the validity of a research tool by using a Face Validity by the judgment of an expert who knows the subject (Subject matter Specialists) by checking the accuracy of the content (Content Validity) by Determination of the behavior between the IOC (IOC) was created to provide the tools.

3.5.2 The researcher get together the comment to solve the questionnaire as follow 3 connoisseurs to evaluate the questionnaires effectively before used to collect data.

3.6Collect Data

3.6.1 Personal information

3.6.2 Opinion on the development of green packaging from banana fiber for instant food products as envelope style (Stand-up pouch).

3.6.3 Opinion on the development of green packaging from banana fiber for instant food products as box style (Paper Box).

3.6.4 Opinion on the development of green packaging from banana fiber for instant food products in cup paper style (Paper Cup).

3.6.5 Opinion on the development of green packaging from banana fiber for instant food products as paper bag style (Zip Lock Paper Bag).

3.7Analyze

Data analysis of the status of the questionnaire. The development of green packaging development from banana fiber for instant food products, including envelopes (Stand-up pouch), box (Paper Box), paper cup (Paper Cup) and paper bags (Zip Lock Paper Bag). Analysis procedures can be divided into two steps.

3.7.1 Analysis of data from the test. The data collected and processed using the statistical program SPSS - Statistic Package for the Social Science and the descriptive statistics for each of the various factors are as follows.

3.7.1.1 Analysis sex, age, occupation, salary and education. The data was analyzed. Frequency (Frequency) and the percentage to apply to be classified.

3.7.1.2 Analysis of data on the opinion on the green packaging development from banana fiber for instant food products in the envelope (Stand-up pouch), paper (Paper Box), cups, paper (Paper Cup), paper bags (Zip Lock. Paper Bag) in packaging field: structure and graphics. Data were analyzed opinions by the statistical package for the social science program and using mean, percentage and standard deviation

4.50 to 5.00	means very good
3.50 to 4.49	means good
2.50 to 3.49	means medium
1.50 to 2.49	means less
1.00 to 1.49	means least

3.7.2 Qualitative Analysis

The researchers bring all data analysis by processing in statistical data and recommendation to conclude of the development of green packaging from banana fiber for instant food products

Results

Development of green packaging from banana fiber for instant food can be separated into 3 parts as follows.

The first part, survey of personal information

The second part, opinion on the development of packaging for the environment of the fiber banana for packaging food products as envelope style (Stand-up pouch), box style (Paper Box), paper cup style (Paper Cup) and paper bags style (Zip. Lock Paper Bag) by the questionnaire to evaluate the prototype of the packaging in packaging field: structure and graphics.

The third part, recommendation of the experimental use of the development of green packaging from banana fiber for instant food products. Able to leave a comment or suggestion to researcher

The first part, survey of personal information

1. Data Analysis the data from samples group, 100 person had been gathered from female age 35 – 44 who are official worker, 10,001 – 15,000 baht of salary and also finished graduate in bachelor's degree.

The second part, opinion on the development of packaging for the environment of the fiber banana for packaging food products by the questionnaire to evaluate the prototype of the packaging in packaging field: structure and graphics.

1. Data Analysis the opinion on the development of green packaging from banana fiber for instant food products as envelope style (Stand-up pouch)



Figure 1: green packaging from banana fiber for instant food products as envelope style (Stand-up pouch)

The results for the development of green packaging from banana fiber for instant food products as envelope style (Stand-up pouch). Overall opinion average was good. The packaging structure field, in level of opinion “very good”, was found that the packaging structure is suitable for giving as a gift or souvenir, having form beautiful and distinctive and the packaging is unique. Suitable for the product. In the packaging graphics field, in level of opinion “very good”, was found that the text brand is unique and it is easily recognizable as shown for Table 1.

Table 1: shows the questionnaire results of the development of green packaging from banana fiber for instant food products as envelope style (Stand-up pouch)

No	title	(X)	(S.D)	Level of opinion
	The packaging structure			
.1	This package prevent product deterioration, broken or damaged	3.90	1.48	Good
.2	This package contains the format and structure appropriately to maintain	3.40	1.41	Medium
.3	This package is suitable for giving as a gift or souvenir	4.51	0.71	Very good
.4	This package is available for purchase and suit for shelves	4.10	1.56	Good
.5	This package is convenient and easy to use.	4.28	1.20	Good
.6	This package have form beautiful and distinctive	4.62	0.44	Very good
.7	This package present the complete information	3.45	0.82	Medium
.8	This package is unique. Suitable for the product	4.53	0.50	Very good
	Average	4.10	0.48	Good
	The package graphics			
9.	Color appropriately with package	3.86	0.71	Good
.10	Simplicity	4.21	0.98	Good
.11	The text brand is unique	4.67	0.58	Very good
.12	An easily recognizable.	4.53	0.66	Very good
13.	Package appealing	4.34	1.25	Good
14.	Suitable for the product	4.15	1.40	Good
15.	The trend mark can easy to read and understand	4.28	1.12	Good
	Average	4.29	0.26	Good
	All average	4.19	0.39	Good

2. Data Analysis the opinion on the development of green packaging from banana fiber for instant food products as box style (Paper Box)



Figure 2: green packaging from banana fiber for instant food products as box style (Paper Box)

The results for the development of green packaging from banana fiber for instant food products as box style (Paper Box). Overall opinion average was good. The packaging structure field, in level of opinion “very good”, was found that the packaging structure is suitable for giving as a gift or souvenir, having form beautiful and distinctive and the packaging is unique. Suitable for the product. In the packaging graphics field, in level of opinion “very good”, was found that the text brand is unique and it is easily recognizable as shown for Table 2.

Table 2: shows the questionnaire results of the development of green packaging from banana fiber for instant food products as box style (Paper Box)

No	title	(X)	(S.D)	Level of opinion
	The packaging structure			
.1	This package prevent product deterioration, broken or damaged	4.05	0.74	Good
.2	This package contains the format and structure appropriately to maintain	3.42	1.10	Medium
.3	This package is suitable for giving as a gift or souvenir	4.51	0.79	Very good
.4	This package is available for purchase and suit for shelves	4.13	0.89	Good
.5	This package is convenient and easy to use.	4.30	1.24	Good
.6	This package have form beautiful and distinctive	4.68	0.54	Very good
.7	This package present the complete information	3.46	0.77	Medium
.8	This package is unique. Suitable for the product	4.58	0.72	Very good
	Average	4.14	0.48	Good
	The package graphics			
9.	Color appropriately with package	3.86	1.21	Good
.10	Simplicity	4.21	1.32	Good
.11	The text brand is unique	4.67	0.84	Very good
.12	An easily recognizable.	4.53	0.54	Very good
13.	Package appealing	4.34	1.12	Good
14.	Suitable for the product	4.15	1.25	Good
15.	The trend mark can easy to read and understand	4.28	0.83	Good
	Average	4.29	0.26	Good
	All average	4.21	0.39	Good

3. Data Analysis the opinion on the development of green packaging from banana fiber for instant food products as paper cup style)Paper Cup(



Figure 3: green packaging from banana fiber for instant food products as paper cup style (Paper Cup)

The results for the development of green packaging from banana fiber for instant food products as paper cup style (Paper Box). Overall opinion average was good. The packaging structure field, in level of opinion “very good”, was found that the packaging structure is suitable for giving as a gift or souvenir and having form beautiful and distinctive. In the packaging graphics field, in level of opinion “very good”, was found that the text brand is unique and it is easily recognizable as shown for Table 3.

Table 3: shows the questionnaire results of the development of green packaging from banana fiber for instant food products as paper cup style)Paper Cup) 519

No	Title	(X)	(S.D)	Level of opinion
	The packaging structure			
.1	This package prevent product deterioration, broken or damaged	3.88	1.21	Good
.2	This package contains the format and structure appropriately to maintain	3.38	0.80	Medium
.3	This package is suitable for giving as a gift or souvenir	4.52	0.65	Very good
.4	This package is available for purchase and suit for shelves	4.12	1.36	Good
.5	This package is convenient and easy to use.	4.24	1.13	Good
.6	This package have form beautiful and distinctive	4.55	0.82	Very good
.7	This package present the complete information	3.40	0.74	Medium
.8	This package is unique. Suitable for the product	4.53	0.90	Very good
	Average	4.08	0.48	Good
	The package graphics			
9.	Color appropriately with package	3.84	0.54	Good
.10	Simplicity	4.19	0.92	Good
.11	The text brand is unique	4.57	0.88	Very good
.12	An easily recognizable.	4.51	0.69	Very good
13.	Package appealing	4.36	1.45	Good
14.	Suitable for the product	4.12	1.35	Good
15.	The trend mark can easy to read and understand	4.26	1.10	Good
	Average	4.26	0.25	Good
	All average	4.17	0.39	Good

4. Data Analysis the opinion on the development of green packaging from banana fiber for instant food products as paper bag style)Zip Lock paper Bag(



Figure 4: green packaging from banana fiber for instant food products as paper bag style (Zip Lock Paper Bag)

The results for the development of green packaging from banana fiber for instant food products as paper bag style (Zip Lock Paper Bag). Overall opinion average was good. The packaging structure field, in level of opinion “very good”, was found that the packaging structure is suitable for giving as a gift or souvenir, having form beautiful and distinctive and This package is unique. Suitable for the product. In the packaging graphics field, in level of opinion “good”, was found that color appropriately with package, simplicity, the text brand is unique and it is easily recognizable as shown for Table 4.

Table 4: shows the questionnaire results of the development of green packaging from banana fiber for instant food products as paper bag style (Zip Lock Paper Bag)

No	title	(X)	(S.D)	Level of opinion
	The packaging structure			
.1	This package prevent product deterioration, broken or damaged	4.00	1.21	Good
.2	This package contains the format and structure appropriately to maintain	3.45	1.10	Medium
.3	This package is suitable for giving as a gift or souvenir	4.60	0.65	Very good
.4	This package is available for purchase and suit for shelves	4.20	1.26	Good
.5	This package is convenient and easy to use.	4.38	0.86	Good
.6	This package have form beautiful and distinctive	4.68	0.63	Very good
.7	This package present the complete information	3.48	0.90	Medium
.8	This package is unique. Suitable for the product	4.63	0.72	Very good
	Average	4.18	0.50	Good
	The package graphics			
9.	Color appropriately with package	3.96	0.85	Good
.10	Simplicity	4.31	1.24	Good
11.	The text brand is unique	4.44	1.19	Good
12.	An easily recognizable	4.25	1.24	Good
13.	Package appealing	4.39	1.43	Good
14.	Suitable for the product	4.38	0.25	Good
15.	The trend mark can easy to read and understand	4.39	1.43	Good
	Average	4.38	0.25	Good
	All average	4.27	0.40	Good

520

Conclusions and Discussion

This purpose is qualitative research. The synthesis of the documents and related research and the collection of qualitative data. It is consist of observations and

documentation. The data were analyzed and synthesized. This research can conclude as follows.

In the opinion on the packaging to the development of green packaging from banana fiber for instant food products as envelopes style (Stand-up pouch), as box style (Paper Box), as paper cup style (Paper Cup) and paper bags style (Zip Lock Paper Bag.). The research was found that overall opinion are good level of structural packaging. All models show the consistency of the design and identity in structural packaging and Graphics packaging. In all structural packaging, having form beautiful and distinctive, unique and suitable for the product and suitable for giving as a gift or souvenir. The factors are at least in all structural packaging “medium level” is the package contains the format and structure appropriately to maintain because of this packaging produce from a natural material. It can be easily digested. The all graphics packaging found that overall opinion are very good level. Highest score is the text brand is unique. Next, it is easily recognizable. Other factors are good level in all products.

Acknowledgements

This research is a guide and motivate for everyone in society. It bring about to the trend for environmental awareness. To push on using of environmentally friendly packaging. In order to be consistent with government policy for the environmental conservation.

This research has been done with support from the Rajamangala University of Technology Phra Nakhon. Thanks for research supporting and sampling group. Finally, the value and benefits which would be made from this research. The researcher provide guideline on the development of green packaging from banana fiber for instant food products for reducing the environmental problems caused by packaging. Therefore, it preserve resources and save energy in the packaging processing of the next decade.

References

- [1] Bussara Soiraya, Soawaluck Kongkachuichay, Katethip Kir-ngern, Ingkarn Samerjai, Development of Thai-Style Handmade Paper Products from the Cores of Pineapple Fruits, Faculty of Home Economics Technology, Rajamangala University of Technology Phra Nakhon (RMUTP) Chotiwet Campus, .2009
- [2] Prachid Tinabutra, Design of Packaging, O S Printing House, Bangkok, 2000
- [3] Bill Stewart, (2007) *Packaging Design*. China : Laurence King Publishing Ltd.
- [4] Briston, J, and Neill, T. (1972). *Packaging management*. Essex, UK: Gower Press.
- [5] Capsule I, (2008) Design Matters Packaging. China: Rockport Publish