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Creativity: Studying the identity of processed meat packaging for retail entrepreneurs in Thailand

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Abstract: The aim of this research was to compare the newly developed processed meat packaging in Thailand's retail market and to study the factors affecting consumer purchasing decisions. In this study, a mixed methods approach was applied using a structured questionnaire, in which the alpha coefficient was good (0.903), as the research tool. The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) and AMOS programs. The packaging comparison results showed that consumers' satisfaction with the newly developed processed meat packaging led to increased satisfaction. In addition, three factors affecting the new packaging design were identified, which is consistent with the empirical data, and showed discriminant validity that could be applied to separate the factors used to evaluate the customers' feelings in the retail market. The results also indicated that shelf life extension, product differentiation, and convenience of portability were the vital components affecting consumer purchasing decisions. Thus, entrepreneurs can adapt these three factors to the marketing strategies development of their processed meat packaging in order to maximize the distribution opportunities for their sustainable economic stability in Thailand's retail market.

Keywords: *Creativity, Development of Processed Meat Packaging, Retail Entrepreneurs, Retail Market.*

1. Introduction

In the 21st Century, consumers have expressed the importance of processed meat packaging in their purchasing decisions. Moreover, the packaging characteristics influence consumer purchasing decisions (Verbeke et al., 2005; Grobbel et al., 2008) [1-2], especially packaging that displays production standards (Herbes, et al., 2020) [3]. Further, there must be clear product labels that indicate the production source for checking (Yam et al., 2005) [4]. In this case, it enables regulation with morale in production (Giovannucci et al., 2010) [5]. Besides, it is included with the packaging that must be able to preserve the products inside and protect the products for transportation (McMillin, 2017) [6]. As a result, environmental friendliness is an important factor that consumers have viewed with significant importance (Ross & Evans, 2003; Weber Macena et al., 2021) [7-8].

The research results regarding the effect of the materials and color of food packaging on consumer perception and willingness to consume (Berthold et al., 2024) [9] showed that consumers prioritized environmentally friendly packaging and that green packaging influenced the positive perception of the eco-friendly products. Therefore, consumer purchasing decisions are based on the sense of vision and sense of touch. Based on these findings, the researcher intends to employ this concept to design and develop new processed meat packaging based in Thailand's various areas that will be suitable for the Thai retail market and will upgrade the competitiveness of small entrepreneurs.

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Nowadays, consumers are paying more attention to environmental problems, especially the problem of packaging waste. Moreover, products are produced with consideration of changing consumer behavior since consumers are paying more attention to products with packaging that expresses environmental friendliness, meaning it is not harmful to health (Schumann & Schmid, 2018; Weber Macena et al., 2021) [10,8]. In the same way, the government and agencies of the state have enacted laws to control and protect consumers in many areas. Thailand has enacted laws regarding packaging as follows: 1) the Weights and Measures Act in B.E. 2466 (1923) protects consumers from consuming products according to the specified quantity or with the label of food packaging in paper boxes and corrugated boxes with the manufacturing and distribution within Thailand and exported outside the Kingdom of Thailand (Office of the Council of State, 1999) [11]; 2) The Food Act of 1979 requires food producers and importers to be explicitly controlled. Thus, you must first bring food to request registration as a recipe before being registered, and then it can be produced or imported for sale within the country (Office of the Council of State, 1979) [12]; 3) The Consumer Protection Act B.E. 2522 is responsible for controlling, supervising, and coordinating government agencies in Thailand by protecting consumers as well as the right to complain or request compensation for damages when business operators violate consumer rights (Office of the Council of State, 1979) [12]; 4) The Industrial Standards Act in B.E. 2511 at the Office Industrial product standards to be prepared as a guideline for producing quality products and being able to display trademarks on the packaging, which can help increase the credibility of the products by entrepreneurs in Thailand (Office of the Council of State, 1968) [13].

Retail entrepreneurs must therefore have the development in design packaging that reduces the environmental and safety influences from the products (Wikström et al., 2019; Soro, et al., 2021) [14-15], especially for meat processing packaging with retail operators. Moreover, consumers are more conscious of their health and more aware of ethical principles in production, and this appears with the required packaging of transparent product components (Khandpur et al., 2021) [16]. In this case, the packaging that helps maintain and protect product quality must meet consumption standards and be convenient to use (Yam et al., 2005; Lindh et al., 2016; McMillin, 2017) [4,17,6], including convenience for transportation (Cenci-Goga et al., 2020) [18]. Therefore, all development is carried out to support economic changes for social nutrition from consumers in response to the needs of today's consumers for meat packaging. Further, new forms of processing should lead to material development processes for the production of sustainable packaging that will save costs and have no impact on the environment (Schumann & Schmid, 2018) [10].

Thus, the aim of this research was to develop processed meat packaging for retail entrepreneurs in Thailand that can maintain the meat quality longer than the standard packaging and promote efficient product distribution. The research findings can provide an understanding to the small entrepreneurs in Thailand in order for them to recognize the factors affecting the satisfaction of consumers in the retail market so that they can create the identity, uniqueness, and reliable image of their products.

2. Literature Review

The design of the processed meat packaging for the retail entrepreneurs will promote the processed meat products that fulfill customer demand and correspond to consumer behavior. Entrepreneurs can determine the appropriate price based on the consumer purchasing power in the retail market, which comprises low-to-moderate income consumers. Additionally, the entrepreneurs can design a beautiful, simple, and environmentally friendly package that will interest the consumers (Lydekaityte & Tambo, 2020; Schaefer & Cheung, 2018; Sadeghi et al., 2022) [19-21]. This is consistent with the processed meat packaging design concept for small entrepreneurs, which created fair competition between the small and major entrepreneurs (Akkaratananpong et al., 2024) [22]. As a result, the development of small entrepreneurs' potential to upgrade their knowledge and understanding of packaging design

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provides an opportunity for them to compete in the free market. This research applied five dimensions as the criteria.

1) Creating interest and uniqueness: This represents good packaging design to help products stand out and be different from competing products in the market (Srivastava et al., 2022) [23]by using interesting colors or a unique shape that can attract the attention of consumers as well as create positive images and memories in the minds of consumers (Heide & Olsen, 2017) [24].

2) Preserving Freshness: Effective packaging materials and technology can help extend the shelf life of processed meat products successfully (Soro et al., 2021) [15]. Moreover, it also maintains freshness and quality through the materials used to produce the packaging, which is consistent with the hot and humid climate of Thailand. In this case, it shows high temperatures and humidity can affect the spoilage of products. Meat can be processed to create appropriate packaging, including the promotion of consumer satisfaction by creating confidence in packaging to effectively protect and preserve the products inside.

3) Safety and Durability: Meat packaging design processing should give importance to the safety of consumers and the durability of packaging that can wrap processed meat products inside for helping to build trust among consumers by using strong and durable materials for transportation (Pereira et al., 2012) [25]. In addition, the packaging design needs to have a sealing system that can prevent leaks from occurring in transportation, which will build better confidence among consumers (Han et al., 2005) [26].

4) Convenience in portability: The packaging design should emphasize utility by taking into account convenience, which means it is comfortable to use and easy to carry, thus responding to the lifestyles of consumers in Thailand (Kulkarni, 2019) [27]. Packaging must be easy to open and reclose, which can attract consumers' interest since they can use the product conveniently, including using it often without affecting the freshness of the product inside the packaging (Hyslop, 2012) [28].

5) Creating sustainable relationships and needs of consumers: Designing packaging that is consistent with the needs of consumers within the retail market can be considered with factors affecting sustainability. Moreover, it can create a feeling of confidence for consumers. For example, the use of environmentally friendly materials in the designing of packaging that is convenient to carry and use including developing technology to increase the efficiency of storing products inside. Additionally, it is considered to help small entrepreneurs to be able to respond efficiently to the needs of consumers in the market and increase opportunities for business expansion in the future (Rundh, 2005) [29].

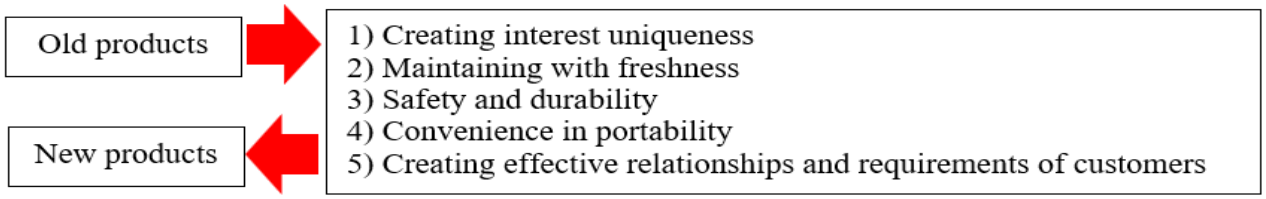

Figure 1.
Framework the design of processed meat packaging for retail operators.

Therefore, the development of packaging can create opportunities for small entrepreneurs to gain access to successful business operations, including selling processed meats with highly competitive potential by operating with strategic planning of design, production, and distribution steps. All five steps are according to the needs of consumers in today's retail market. As a result, it can also create economic stability and sustainability for traders and distributors of processed meat in the retail market of Thailand with high efficiency.

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3. Methodology

3.1. Research Objectives

1) To compare newly developed and old processed meat packaging
2) To study the factors affecting consumers' purchasing decisions concerning processed meat packaging

3.2. Research Scope

This research utilized an applied research approach (Brown, 2015)[30]. with the following steps: 1) Data Study, 2) Design, 3) Experiment, 4) Analysis, and 5) Determining New Design Factors and others by experimenting. Moreover, the researcher will compare new and old packaging of processed meat packaging in Thailand and determine the factors affecting consumer purchasing choices in the Thai retail market for processed meat. The research question concerned the factors affecting the consumer satisfaction with the processed meat packaging in the Thailand retail market.

A: Research Population: A total of 8,014 consumers who choose to buy processed meat products in the retail market of Thailand comprised the population (Fresh markets with commercial registration using small factories for the production of processed meat in 2022).

B: Research Sample: A total of 385 consumers of processed meat in the retail market in Thailand comprised the sample using stratified sampling (Koyuncu & Kadilar, 2009) [31]. before being divided randomly into four regions of Thailand, comprising the Northern region, the Northeastern region, the Eastern region, and the Central area.

- To compare the consumer satisfaction with the current and new packaging by studying the factors affecting the purchase decisions on processed meat in Thailand's retail market. From the application of the Taro Yamane method, the reliability was 95% and the margin of error was 5%. (Yamane, 1973) [32].

C: Research Tools: This research applied a structured questionnaire that asked small entrepreneurs (SMEs) questions about packaging formats affecting consumer purchasing decisions and satisfaction with newly developed processed meat packaging. Moreover, the questions were in the form of variables that can be observed and quantified using The quality of the questionnaire that was used to collect the data was evaluated as follows.

- 5-point Likert rating scale: the Item-Objective Congruence Index (IOC) was 0.682, which was acceptable at > .50 (Turner & Carlson, 2003) [33].
- Cronbach's Alpha was 0.854, which was acceptable at > .70. Therefore, the questionnaire was reliable and could be used to collect data from the sample group (Peterson, 1994) [34].

D: Data analysis: This research applied statistics for research to determine the factors affecting the customer purchase decision process (Brown, 2015) [30], which included mean, standard deviation (S.D.), paired sample t-test, and exploratory factor analysis (EFA). The statistics research was conducted with SPSS and confirmatory factor analysis (CFA), which analyzed the data with AMOS (Kyriazos, 2018; Hair et al., 2019) [35-36].

E: This research was certified and approved according to the research ethics standards Institutional Review Board (IRB) of King Mongkut's Institute of Technology Ladkrabang. Moreover, according to document number EC-KMITL_67_043, the project received approval from Human Research Ethics No. 43/2024, thus allowing the study to be conducted by the researcher.

F: The research methodology included an aspect from the research on the influence of exposure to novel food packaging on consumers' adoption of innovative products (Guo et al., 2024) that presented the results revealing that 1) the color and harmony of the shape of the packaging impact consumers' feelings, 2) the packaging that has the shape and color that do not represent the product inside the packaging has a negative impact on consumers, and 3) the quality of the food in the package affects consumers after purchasing. Based on these three conclusions, the researcher chose to apply them to a

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study on the identity of processed meat packaging for retail entrepreneurs in Thailand and to determine the factors that affect the purchasing decision on processed meat in the retail market of low-to-moderate income consumers.

4. Results

Comparing steps with new and old packaging styles that appear to be used internally from Thailand's processed meat retail market with studying factors affecting consumers' selection of processed meat products.

Table 1.
Comparing consumer satisfaction with the old and new packaging

Product packaging (Original) (Pretest)			**Development guidelines**	**Product packaging (New) (Posttest)**		
 Old product image			1) Creating uniqueness and interest 2) Preservation and freshness 3) Safety and durability 4) Convenience and portability 5) Creating sustainable relationships and meeting the needs of consumers	 New product image		
Satisfaction			Consumer satisfaction assessment questions	Satisfaction		
Mean	SD	Level		Mean	SD	Level
2.842	0.766	Moderate	T1) Various sizes to be available and easy to store	3.530	0.918	High
2.805	0.754	Moderate	T2) Being convenient to carry	3.491	0.896	High
2.800	0.725	Moderate	T3) Being stored for a long period	3.483	0.971	High
2.917	0.763	Moderate	T4) Appropriate material without harmfulness to users	3.608	0.887	High
2.935	0.724	Moderate	T5) Appropriate pattern with consumer needs	3.566	0.936	High
3.083	0.731	Moderate	T6) Unique and appropriate formats	3.925	0.937	High
3.052	0.738	Moderate	T7) Complete packaging information to be easy to understand	3.971	0.956	High
3.052	0.716	Moderate	T8) Appropriate price for consumers of all ages	3.901	0.863	High
3.104	0.669	Moderate	T9) Convenient packaging to be purchased	3.948	0.818	High
3.078	0.688	Moderate	T10) Identity of processed meat with appropriate design	3.857	0.880	High
3.062	0.682	Moderate	T11) Beautiful color packaging and patterns	3.660	0.833	High
3.073	0.703	Moderate	T12) Selling packaging through many channels in the market	3.868	0.826	High
3.119	0.726	Moderate	T13) Strong and durable packaging	3.829	0.824	High
3.065	0.687	Moderate	T14) Packaging available in many sizes to be convenient to carry	3.951	0.810	High

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Table 1 shows the results of comparing the original packaging and the new packaging that was designed with the concepts of 1) Creating Interest and Uniqueness, 2) Preservation and Freshness, 3) Safety and Durability 4) Convenience and Portability and 5) Creating Relationships and Needs of Consumers with Sustainability with the non-development of original packaging format. It had a score of 41.9, and the newly developed packaging format had a score of 52.5 out of a total of 70 points in the evaluation and results from examining the relationship between original packaging and new packaging. In addition, it can be applied to design principles from all five factors, which appear to show a statistically significant relationship (r=.868, p = .000) with the Paired Sample t-test test statistics.

In this case, the differences can be compared between the old packaging and the new packaging, and the test statistic was equal to 49.662 with degrees of freedom equal to 384 and p equal to .000. Therefore, it can be concluded that, after it has shown the development of the new packaging prototype, it was found that the new development resulted in a statistically significant increase in satisfaction values at the .05 level when evaluating consumer satisfaction with processed meat packaging, as shown in Figure 2.

Figure 2.
Characteristics of a new type of packaging developed from the factors.

Searching steps for important factors affecting processed meat packaging among consumers who choose to purchase processed meat products in the retail market of Thailand: The researcher utilized the data from the results of evaluating new processed meat packaging to determine the factors affecting consumer satisfaction and stimulating feelings of satisfaction in consumers after receiving a response. In addition, the researcher carried out exploratory factor analysis in this step to be performed by EFA (Exploratory Factor Analysis) according to the analysis steps as follows.

Step 1: Grouping of studied variables by using Exploratory Factor Analysis (EFA) with the collection of data from consumer satisfaction with new processed meat packaging formats for finding latent variables affecting consumer satisfaction. In this case, it used a survey of observed variables from the results of the satisfaction assessment by identifying common factors, including explaining the relationship between all available observed variables. In addition, the researcher used the indicators to check the following: 1) Preliminary Agreement before Research, 2) Testing of the Relationship from Observed Variables, and 3) Checking of the clustering relationship among observed variables (Joreskog & Sorbom, 1996) [37].

In this case, the research aims to identify the factors affecting the increase or decrease in the level of consumer satisfaction with the newly developed processed meat packaging format based on certain concepts including 1) Creating an Attractive Identity, 2) Preservation and Freshness, 3) Safety and

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Durability, 4) Convenience in Carrying, and 5) Creating Sustainable Relationships with the Needs of Consumers and others by studying the relationship between factors affecting satisfaction with the new packaging format according to measuring values with the specified indicators:

1. Defining 14 variables to study

2. Determining the minimum number of reliable samples with the research on a minimum sample size of 385 people

3. Checking the value of the commonality from the variables with explaining the commonalities that should have a value > .57 or higher. Moreover, it was found that all variables in the research had commonalities between .575 - .889. Therefore, it shows that all analyzed variables have a commonality value higher than .57 for every variable. Thus, it ensures that all variables can be grouped, leading to being combined into a factor that has a KMO and Bartlett's Test value greater than .57, with the alpha coefficient appearing to be at a good level (0.903). As a result, it was found that all analyzed data could be grouped into variables by analysis with Exploratory Factor Analysis (EFA).

According to the results of the evaluation of fourteen variables, which were combined into three factors, they can be determined as factors affecting consumer satisfaction with processed meat packaging formats in the retail market of Thailand, as shown in Table 3.

Table 2.
KMO and Bartlett's test of the sample group.

KMO and Bartlett's test	
Kaiser-Meyer-Olkin Measure of sampling adequacy	0.901
Bartlett's test of sphericity approx. chi-square	2657.045
df	91
Sig.	0.000

According to KMO and Bartlett's Test, it showed a value = .901; a value greater than 0.65 is considered to have passed the specified criteria. Moreover, the data collected can explain the satisfaction that consumers have with the new packaging in the same direction, including all data to be analyzed with Exploratory Factor Analysis (EFA) (Chi-Square = 2657.045; Significant = 0.000). Therefore, it can be concluded that all fourteen observed variables are related to each other, as shown in Table 2.

According to the results of the evaluation of fourteen variables, which were combined into three factors, they can be determined as factors affecting consumer satisfaction with processed meat packaging formats in the retail market of Thailand, as shown in Table 3.

Table 3.
Anti-image matrices analysis (Measures of sampling adequacy: MSA)

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
T1	0.890[a]													
T2	-0.362	0.899[a]												
T3	-0.294	-0.273	0.916[a]											
T4	-0.250	-0.172	-0.010	0.916[a]										
T5	-0.085	-0.184	0.010	-0.252	0.920[a]									
T6	0.047	-0.066	-0.003	-0.058	-0.003	0.839[a]								
T7	0.081	-0.023	-0.076	0.023	0.110	-0.613	0.804[a]							
T8	-0.138	0.044	0.082	0.061	-0.251	-0.159	-0.135	0.928[a]						
T9	-0.022	0.118	-0.056	-0.101	-0.136	-0.058	-0.237	-0.108	0.927[a]					
T10	-0.033	0.029	-0.015	-0.269	0.094	-0.034	-0.077	-0.075	-0.031	0.916[a]				
T11	0.081	-0.074	-0.088	-0.086	-0.052	0.022	-0.017	-0.136	-0.016	-0.238	0.926[a]			
T12	-0.156	-0.013	0.056	0.029	-0.074	-0.045	-0.013	0.012	-0.184	0.056	-0.146	0.939[a]		
T13	0.054	0.019	-0.045	-0.091	-0.100	0.019	0.019	-0.002	-0.139	-0.100	0.066	-0.128	0.903[a]	
T14	-0.066	-0.049	0.010	0.094	0.010	-0.056	0.035	-0.022	-0.225	-0.060	-0.044	-0.098	-0.334	0.903[a]

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Table 4.
Factor axis rotation weight values by using the verimax method and setting the element weight at 0.57 or higher

Number	Variables	Component			Community
		Factor 1	Factor 2	Factor 3	
T2	It is convenient to carry.	0.845			0.751
T1	Various sizes are available and easy to store.	0.839			0.769
T3	It can be stored for a long period.	0.754			0.603
T4	The material is suitable and does not harm the user.	0.751			0.685
T5	The pattern is suitable for the needs of consumers.	0.655			0.595
T7	The packaging has complete information and is easy to understand.		0.889		0.816
T6	The format is unique and appropriate.		0.860		0.778
T8	The price is appropriate for consumers of all ages.		0.616		0.547
T13	The packaging is strong.			0.803	0.693
T14	The packaging is available in many sizes and is convenient to carry.			0.779	0.674
T12	Packaging can be sold through many channels in the market.			0.601	0.500
T9	Packaging is convenient to choose and buy.			0.575	0.686
Sum of squares		3.685	2.782	2.417	8.884
Percentage of trace		26.320	19.871	17.268	63.459

Note: *Loadings less than .57 without the factor determination.

According to the results of Table 4 for Total Variance Explained: Method for Extraction, it was found that fourteen variables were observed before being grouped into three factors that appear to have important weight values as follows: Factor 1 = 26.320, Factor 2 = 19.871, Factor 3 = 17.268. Besides, it can be analyzed with a Scree Plot showing the Eigenvalue from all fourteen variables. As a result, it appears that the data for all three factors are well arranged, and the graph has a slope from factor 1 to factor 3.

In conclusion, the observed variables that will be analyzed with the exploratory component will only include twelve variables from the selection of observed variables with loadings greater than .57; all twelve observed variables can explain 63.459 percent of the variance in the data and can be grouped into 3 factors:

Factor 1 consists of T2, T1, T3, T4, and T5.
Factor 2 consists of T7, T6, and T8.
Factor 3 consists of T13, T14, T12, and T9.

Step 2: Checking the suitability of variables in each factor by using Confirmatory Factor Analysis (CFA)

According to the First or Second Order analysis, it showed that the researcher tested the relationship between observed variables influencing consumer satisfaction with processed meat packaging in the retail market of Thailand. Moreover, the inspection process is considered to be in statistical agreement with reference to the probability of the data, which was used in the factor analysis

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process to be worth the appropriate KMO and Bartlett's Test (KMO = .891) while the Bartlett's Test of Sphericity value appeared = 2345.739 (Sig. = .000). In addition, it was found that both 1 and 2 observed variables were related, which is suitable for analysis with Confirmatory Factor Analysis (CFA), as shown in the Cronbach's Alpha value at the level of .894. Then, the questions were used to collect information for measuring the observed variables, and they were appropriate at a good level, as shown in Table 5.

According to the confirmatory factor analysis, the results show the design for processed meat packaging in the Thai retail market that was newly developed with the AMOS program. Moreover, the index value for checking the model is consistent according to the criteria that were obtained (Schumacker & Lomax, 2004) [38] as follows: χ^2=27. 982, df =20, relative χ^2= 1.399, p =0.111, RMSEA = 0.032, RMR = 0.019, GFI = 0.988, AGFI = 0.954, NFI = 0.988, TIL = 0.989, CFI = 0.997. In this case, it showed the consistency index according to the specified criteria, which is relative to χ^2 < 2, RMSEA and RMR index < 0.05, index GFI, AGFI, NFI, TLI > 0.95 and others. Additionally, it appears to be consistent with the newly developed packaging design factors and consumer satisfaction, according to the specified criteria (Schumacker & Lomax, 2004; Suksawang, 2014) [38-39]. In conclusion, it can be concluded that the development of processed meat packaging is able to meet the needs of consumers in the retail market of Thailand. Further, it must rely on three factors: Factor 1 involves extending the Shelf Life of Freshness, while Factor *2* involves making a difference for better packaging visibility, and Factor 3 is convenience in portability. The entrepreneurs of processed meat can rely on all three factors to participate in the process. The development of processed meat packaging which will have a positive impact on consumer satisfaction will likely increase.

Besides, it appears with the Average Variance Extraction (AVE) and Composite Reliability (CR) values of both 3 factors that indicate good information and can be trusted to truly represent the elements: 1) Factors in extending shelf life and preserving freshness that can be representative of the components (AVE = 0.610, CR = 0.886), 2) Factors that create differences for better packaging visibility, which is representative of the components (AVE = 0.649, CR = 0.844), and 3) Convenience factor in portability that can be representative of the elements (AVE = 0.508, CR = 0.802) and others. Thus, it showed AVE value and CR to meet the specified criteria (Hair et al., 2019) (CR > 0.7 and AVE > 0.05 and MSV < AVE and ASV < AVE). Additionally, all information has the characteristics of Discriminant Validity that are different and not related, while the factors can be separated to consist of three factors arising from twelve indicator variables, as shown in Table 5 and Figure 3.

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Table 5.
Second order confirmatory factor analysis (Second order)

Latent variable, observable variable	Extending the shelf life of freshness				Better packaging visibility				Convenience in carrying				r^2
	b	***β***	***SE***	**CR**	***b***	***β***	***SE***	**CR**	***b***	***β***	***SE***	**CR**	
FrdT2	0.996	0.848	0.504**	18.388	-	-	-		-	-	-		0.719
FrdT1	1.000	0.832	-	-	-	-	-		-	-	-		0.629
FrdT3	0.933	0.731	0.068**	13.633	-	-	-		-	-	-		0.535
FrdT4	0.936	0.805	0.068**	13.857	-	-	-		-	-	-		0.647
FrdT5	0.825	0.674	0.064**	12.853	-	-	-		-	-	-		0.454
DifT7	-	-	-		0.864	0.803	0.073**	11.833	-	-	-		0.644
DifT6	-	-	-		1.000	0.947	-	-	-	-	-		0.897
DifT8	-	-	-		0.616	0.636	0.051**	12.178	-	-	-		0.404
PirT13	-	-	-		-	-	-		0.744	0.651	0.090**	8.301	0.423
PirT14	-	-	-		-	-	-		0.689	0.610	0.071**	9.713	0.373
PirT12	-	-	-		-	-	-		0.781	0.677	0.081**	9.613	0.459
PirT9									1.000	0.882	-	-	0.778
Latent variable	Development new packaging				R^2	AVE	CR	MSV	ASV				
	b	*β*	*SE*	*CR*									
Frd	0.712	0.641	0.087**	8.208	0.411	0.610	0.886	0.398	0.318				
Dif	0.861	0.663	0.100**	8.626	0.439	0.649	0.844						
PirT9	1.000	0.956	-	-	0.914	0.508	0.802						

Note: Chi-square = 27.982 ; df = 20, relative Chi-square = 1.399, p-value = 0.111, GFI = 0.988, AGFI =0.954, NFI = 0.988, TIL = 0.989, CFI = 0.997, RMSEA = 0.032, RMR = 0.019 [* P < 0.05; ** P < 0.01].

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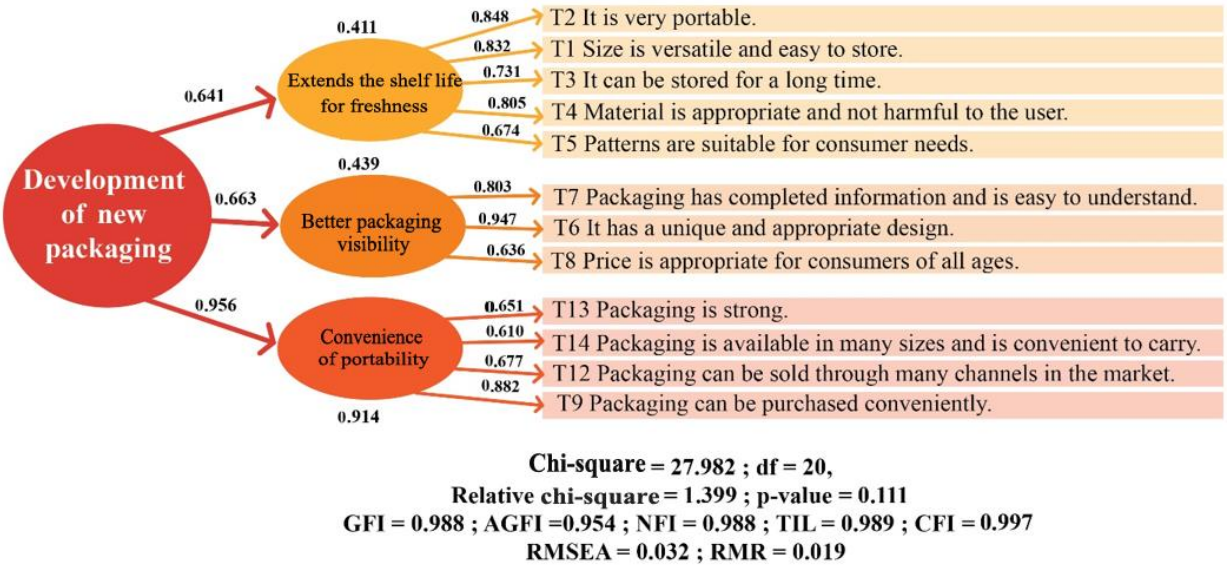

Figure 3.
Second order; standardized estimates and final structural equation model

According to picture 3, it shows the conclusion that the data from consumers who are satisfied with processed meat packaging can be used to develop processed meat packaging for the retail market in Thailand using three factors that influence consumer satisfaction, which can be arranged in order from highest to lowest as follows:

1) Factors for Extending the Shelf Life of Freshness, such as FrdT2, FrdT1, FrdT4, FrdT3 and FrdT5, respectively

2) Differentiating factors for Better Packaging Visibility, such as DifT6, DifT7, and DifT8, respectively

3) Portability Factors such as PirT 9, PirT 12, PirT13, and PirT14, respectively

These three factors were consistent with the concept of sustainable packaging design (Akkaratananpong et al., 2024) [22] as they promoted the development of processed meat packaging in the retail market that minimized the inequality of competition between the small and major entrepreneurs in Thailand's processed meat retail market, and encouraged entrepreneurs to learn how to adopt industrial technology to develop high-quality meat packaging at an appropriate cost with the least environmental impact.

Regarding the research results, entrepreneurs should be aware of the significance of three factors when developing the new packaging as follows.

1) Shelf-life extension: Consumers express demand for the product when they can see the processed meat inside of the package and also want sealed packaging.

2) Product differentiation: The consumers want the attractive and clear graphics on the package that will encourage their purchasing decision. In addition, the graphics should present the product's identity via the colors and patterns on the package.

3) Convenience of portability: The consumers in the retail market want to purchase products in a small volume or for 1 to 2 consumptions. Thus, the designed processed meat packaging should be portable.

If an entrepreneur designs the packaging based on these three factors, consumers will be more likely to have a positive attitude towards the product. For this reason, these factors are significant components in increasing consumer satisfaction.

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Table 6.
Results of consumer satisfaction assessment to be evaluated with all three factors.

Number	Satisfaction assessment list (n=385)	Mean	SD	Satisfaction level
1	Extending the shelf life of freshness	3.536	0.758	Very satisfied
2	Making a difference for better packaging visibility	3.932	0.785	Very satisfied
3	Convenience of portability	3.899	0.640	Very satisfied
	Totals	3.789	0.602	Very satisfied

According to the results of the consumer evaluation, it revealed satisfaction with processed meat packaging based on the evaluation of three factors. In this case, it was found with the following details: 1) Making a difference for better packaging visibility to be satisfied was at a high level (Mean = 3.932; SD = 0.785); 2) Convenience of Portability was at a high level of satisfaction (Mean = 3.899; SD = 0.640); 3) Extending the Shelf Life for Freshness. As a result, satisfaction was at a high level (Mean = 3.536; SD = 0.758) and the group of processed meat consumers in the retail market was satisfied with all three factors at a high level (Mean = 3.789; SD = 0.602), as shown in Table 6.

5. Discussion

Processed meat packaging design for retailers and distributors is considered an important factor and directly affects the chances of success in selling processed meat products to consumers. Besides, this research aims to create innovation by studying the important factors for designing processed meat packaging that is appropriate to satisfy consumers in the retail market of Thailand. In addition, this research will help business retail processing of processed meat by small entrepreneurs to grow and add value economically for carrying on business in the field of processed meat.

Packaging development can create business opportunities for small entrepreneurs to improve their chances of success in business. Moreover, processed meat in the retail market entrepreneurs can apply the factors for developing processed meat packaging with using in their organizations to enhance their business strategy potential. In this case, it represents the business process packaging design and development, and others. In the same way, it will depend on the application of five principles: 1) Creating Uniqueness, 2) Preserving Freshness, 3) Safety and Durability. 4) Convenience in Portability, and 5) Building Relationships and Consumer Needs to gain sustainability and others. All five aspects are consistent with the creative concepts influenced by modern consumers (Wyrwa & Barska, 2017) [40]. Therefore, this research is considered to promote new and unique innovation in packaging by helping businesses of retail processed meat to flourish. It also helps increase economic value by creating processed meat packaging that builds confidence and stimulates the opportunity to make product choices among consumers in Thailand's low-end market. Thus, the needs of consumers in the current Thai retail market can be met by creating sustainability in the competition of Thailand's retail market for entrepreneurs and distributors of processed meat.

Exploratory factor study can find the elements that are important variables affecting consumer satisfaction with newly developed processed meat packaging. Moreover, it is based on information from fourteen observed variables with high predictive values of three factors appearing from twelve variables, allowing entrepreneurs to develop their own processed meat packaging for distribution in the Thai retail market. Thus, future research can also integrate the variables and factors with marketing concepts to strengthen sales promotion strategies according to consumer needs (Egwutvongsa, 2023)[41]. This case has studied the factors involved in the development of processed meat packaging in the Thai market with the idea of future research and development in consideration of preparation for dealing with changes in consumer demand in the future. Similarly, it also stimulates creative thinking in developing packaging that is different from the traditional packaging in the current market (Egwutvongsa, 2021;

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Egwutvongsa & Seviset, 2021) 42-43]. In this case, the presentation of the factors for developing processed meat packaging in the Thai market can aid as a method for solving problems with systematic thinking for creating new types of packaging. According to the results of the research, it will effectively respond to the needs and feelings of consumers to increase the chance of success through boosted sales from three factors: 1) Factor for extending the shelf life of freshness, 2) Factor for difference in better visibility of the packaging, and 3) Factor for portability and others (Aktan & Anjam, 2021). In this case, all three factors are from consumer demand to respond to the needs of consumers at the highest level with determining guidelines for designing and developing packaging to meet the needs of consumers. As a result, it is considered to be a presentation of facts on the needs of consumers of processed meat in the retail market of Thailand (Amirkhizi et al., 2022; Kijmongkolvanich et al., 2023) [44-45].

The results are from checking the appropriateness of the variables in each factor influencing consumers' feelings and satisfaction with processed meat packaging for the retail market in Thailand. Moreover, it is summarized into three factors: Factors with one aspect for extending the shelf life of freshness, Factors with two aspects for making a difference with better packaging visibility, and factors with three aspects from portability convenience. In this case, it is obtained from twelve indicator variables influencing the results, and it also involves a relationship between indicator variables and factors. Then, all three factors can be used in packaging development or developed into a marketing strategy for processed meat for the retail market in Thailand (Egwutvongsa, 2023; Nikolic et al., 2022) [46-47]. As a result, all three factors will affect future opportunities for the success of small business operators in responding to consumer needs. The influential factors can be detailed using three factors as follows:

a) Factor 1 involves extending the shelf life of freshness from the innovative design of processed meat packaging: This factor is according to the need to show the potential to extend the shelf life of processed meat and maintain freshness. Besides, it is from the new product for increasing consumer satisfaction by displaying properties from modified atmosphere packaging (MAP), vacuum packaging, and antimicrobial packaging materials. Thus, it must help extend the shelf life and preserve product quality (Schumann & Schmid, 2018)[10] according to the design principles for meat packaging, which includes vacuum packaging to extend the shelf life of meat and animal products. Similarly, it also helps to inhibit the growth of microorganisms and slow down the oxidation of fat, including creating suitability for selling and storing products by traders (Papadochristopoulos et al., 2021) [48].

b) Two differentiating factors for better brand visibility: Creative packaging design can display the distinctive novelty of the product's logo including helping to stand out on the product shelf. Besides, it depends on distribution and also helps attract the attention of consumers, while the features will make their products different from those of competitors currently on the market. Therefore, it involves designing eye-catching patterns and colors as well as creating unique shapes by developing appropriate packaging and labels to increase brand visibility and impress consumers. In this case, it is according to the research on the influence of logos on consumer decision-making (Rundh, 2016) [49]. As a result, the aesthetics of packaging influences consumers' purchasing decisions. Packaging should be viewed and demonstrate the quality of the product to instill trust, which can lead to more purchasing decisions among consumers.

c) Factor 3 for Convenience in Portability: Consumers who use the retail market in Thailand are considered to comprise a market that has an area within each community where consumers purchase processed meat products for household consumption. Moreover, there is a need for packaging that can be easily carried or taken back to the consumer's residence when traveling by motorcycle, which is considered a highly popular vehicle in Thailand (Arenas-Jal et al., 2020) [50]. Therefore, the characteristics of the packaging are developed with characteristics: 1) Complete Sealing 2) Resistance to Hot Weather 3) Sufficient Quantity for Household Consumption. 4) Increasing Convenience in Carrying (Kerry, 2014) [51] by giving importance to searching for packaging features with the

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strategic planning of small entrepreneurs. It will also help strengthen their competitiveness to effectively meet the needs of consumers in the low-end market of Thailand.

According to all three factors consisting of twelve indicator variables, creativity will be used to participate in the design of processed meat packaging for retail operators of processed meat before leading to practical steps. It thus includes education, market trends, education, technological advancements, education, legal requirements, and education, consumer needs, and others. Therefore, retail entrepreneurs that are considered small operators will be able to compete with larger operators, including the necessity to have knowledge and guidelines for developing processed meat products. Similarly, it can be possible to compete with large entrepreneurs in the Thai market. Thus, the results that arise from this research will play a part in reducing the gap in the potential of small entrepreneurs to compete more effectively with large entrepreneurs. As a result, the market monopoly can be reduced and the influence of larger operators in the processed meat market can be decreased throughout Thailand (Roggeveen, et al., 2021) [52].

The development of processed meat packaging is considered a new innovative idea for retail entrepreneurs in Thailand by encouraging small entrepreneurs to see the importance of building a brand image with higher product quality. Moreover, it can create opportunities to compete with larger entrepreneurs. Processed meat packaging should have the following characteristics: 1) Quality, 2) Correctness to be consistent with standard regulatory requirements, 3) Extended shelf life, 4) Improved packaging visibility, and 5) Increased convenience in purchasing for consumer groups and others. Then, all three factors are considered based on characteristics from the meat packaging of processed products, including the demand for sales in the retail market of Thailand; all three factors influence the purchasing decisions and perceptions of consumers in terms of product quality.

When considering the results regarding these three factors, they were in line with the study "The Effect of Product and Packaging Variations on Purchasing Decisions," which revealed that the packaging of small entrepreneurs affects consumer purchasing decisions, and the appropriate packaging design provides an opportunity to more effectively compete in the market (Mahira et al., 2024) [53]. It was similar to the aspect that the consumers in the retail market prioritized, which was the appearance and color of the packaging, when they decided to purchase the product. When comparing the research results with the results of a study on the impact of the material and color of food packaging on the perception and willingness to consume of consumers (Berthold et al., 2024) [9], the results were similar in that the consumers considered the internal feeling in their decision to purchase the product and prioritized the feeling that they could demonstrate environmental responsibility, which caused them to favor green and brown color tones, as these had a positive impact on their emotions.

6. Conclusions

According to the results from the development of new packaging, it was found that test statistics were obtained equal to 49.662 at degrees of freedom equal to 384 and p = .000. Thus, it can be concluded that processed meat packaging has been developed from factors of the concept, including 1) Creating Interest and Uniqueness, 2) Preservation and Freshness, 3) Safety and Durability, 4) Convenience and Portability, and 5) Reflection with Market Needs and Sustainability. In addition, it appears that the satisfaction assessment of processed meat consumers has all five concepts that resulted in increased satisfaction scores. Similarly, it has statistical significance at the .05 level. When considering variables affecting consumer satisfaction, there are twelve indicator variables influencing three factors concerning the level of satisfaction among consumers. In this case, consumption consists of factors with one aspect, extending the shelf life for freshness, while the factors with two aspects can make a difference for better packaging visibility as well as factors with three aspects from the convenience in portability.

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When examining the appropriateness of the variables of each factor affecting consumer satisfaction, it was shown that the three factors positively impacted the consumers' purchasing decision.

The design of processed meat packaging in Thailand's retail market requires the development of a biodegradable plastic application framework to design new environmentally friendly packaging. The development steps should be integrated with the concept of eco-design in order to invent eco-friendly processed meat packaging for the retail market and to improve the consumers' awareness of environmental responsibility.

The use of bioplastic and eco-design concepts to design the new packaging initiates the packaging design process, which corresponds to the consumer demand in the retail market and promotes the circular economy with environmentally friendly products. The goal is for the new processed meat packaging to fulfill the consumer demand appropriately and reduce the use of natural resources and pollution emissions during the product life cycle. Therefore, the knowledge from this research will influence the entrepreneurs' awareness of the environment when designing the new processed meat packaging design to create a positive image for their products.

7. Recommendations

The design of packaging using the three factors positively impacts the relevant people: the consumers, manufacturers, and retail entrepreneurs. The research results explain the factors affecting consumer satisfaction that encourage the opportunity to purchase the product and promote a good image. Therefore, these can be applied as guidelines for designing the processed meat packaging that is appropriate to the current situation and will maximize the opportunities for small retailers to compete with the major entrepreneurs.

In addition, the research results suggest the utilization of bioplastic. However, the entrepreneurs and packaging designers must still remain aware of and show responsibility for the plastic waste issue. The processed meat entrepreneurs and packaging designers should therefore propose the guidelines for developing sustainable packaging, such as 1) the use of plastic made from agricultural products, 2) the use of natural ink, 3) the reduction of packaging components, and 4) the recycling of packaging in various formats. These guidelines will demonstrate the cooperation of all sectors: private, government, and public, to resolve the issues resulting from use of processed meat packaging in the future.

For this reason, the government's support to legislate relevant laws and issue appropriate regulations to promote processed meat entrepreneurs to use packaging made from natural materials such as corn, cassava, and sugar cane, is needed. Additionally, the government sector should encourage researchers to conduct further studies to develop environmentally friendly packaging and urge the reduction of the use of non-degradable plastic packaging. The government's environmentally friendly policies and strategies will redirect entrepreneurs to focus on learning about natural packaging development and the reduction of carbon dioxide emitted from the manufacturing process. These guidelines will initiate a green cycle that will expand the use of green packaging throughout Thai society and strengthen the security of natural resources and the environment for the sustainability of future generations.

Institutional Review Board Statement:

The Ethical Committee of the King Mongkut's Institute of Technology Ladkrabang, Thailand has granted approval for this study (Ref. No. 11/2024).

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