

CONSUMER ADOPTION OF EDIBLE FOOD PACKAGING IN COIMBATORE

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ABSTRACT:

Edible packaging is being developed as a green solution to conventional food packaging, which is environmentally friendly and minimizes waste. In this review, the idea of edible packaging, advantages, challenges, and consumers' attitudes toward edible packaging in Coimbatore are examined. The gap in knowledge in consumer awareness, willingness to pay, and barriers to adoption will be addressed in this study. Based on available literature and findings from surveys, this paper contributes to industry stakeholders in promoting innovation and market acceptability.

Keywords: Edible Packaging, Sustainability, Consumer Awareness, Consumer Adoption, Willingness to Pay.

INTRODUCTION:

Edible packaging is a new, environmentally friendly packaging system that is created to be eaten together with the food it carries, thereby minimizing waste and plastic pollution. Produced from natural ingredients such as seaweed, rice, milk proteins, and fruits, it complements food with additional flavors without being biodegradable or sustainable. In contrast to regular plastics that take centuries to leave the environment, edible packaging decomposes or gets consumed and hence offers a good solution to the world's waste issue. Just as the past of packaging developed from natural packaging to industrially produced plastics, the increased concerns for the environment have promoted biodegradable and compostable materials. Edible packaging is a revolutionary concept, both waste-reducing and providing an improved consumer experience. As consumers increasingly seek more sustainable packaging options, edible packaging may have an important part to play in eliminating single-use plastics and preventing harm to the environment.

STATEMENT OF PROBLEM:

In spite of its promise, edible food packaging is still not adopted on a wide scale, and there is inadequate research addressing consumers' attitudes and the pragmatic reasons for mass adoption. Although the interest in eco-friendly packaging has been increasing, there are limited in-depth studies examining consumers' awareness, attitudes, and intention to use edible packaging, especially in cities like Coimbatore. This research gap does not allow for a complete comprehension of the market forces and consumer attitude towards such innovations.

OBJECTIVES:

The research seeks to fill the gaps that currently exist by concentrating on a number of important areas of consumer behavior towards edible food packaging. The particular objectives of the study are:

1. To Examine Consumer Awareness and Perception Towards Edible Packaging.
2. To identify barriers to Consumer Adoption Barriers of Edible Packaging.
3. To evaluate Consumer Willingness to Pay a Premium for Food products Packaged in Edible Material due to Sustainability or Health benefits.
4. TO determine the level of consumer interest in edible packaging for specific food categories e.g. - snacks, beverages, fast food and its potential market appeal.

LITERATURE REVIEW:

The paper "**Edible Coatings for Ready-to-Eat Products: Critical Review of Recent Studies, Sustainable Packaging Perspectives, Challenges, and Emerging Trends**" by **Ina Bremenkamp and Maria José Sousa Gallagher (2025)** investigates the possibility of edible coatings as environmentally friendly packaging options in the expanding ready-to-eat (RTE) food industry. While edible coatings have the ability to control deterioration and inhibit chemical reactions in food, their industry-wide application is hindered by issues of compatibility with food, processing technology, shelf life, storage, costs, and regulatory matters. The review identifies some recent trends such as biodegradable coatings, shelf-life extension, and active/intelligent coatings, and also calls for further studies to enhance coating performance, stability, and cost-effectiveness. Even though these challenges exist, edible coatings offer a highly promising sustainable solution in RTE food packaging and merit further investigation to unlock their full potential.

Vishal Srivastava, Hema Garg (2025) presented on "**Edible Packaging: Novel Approaches for Food Protection and Sustainability**". This chapter delves into edible packaging as a sustainable alternative to traditional packaging, and explains its composition, types, and advantages. It touches on the application of natural resources, regulatory concerns, and its role in food waste reduction. The chapter further examines future trends and the significance of cooperation in the development of edible packaging solutions.

RESEARCH METHODOLOGY:

The research design for the study on consumer adoption of edible food packaging in Coimbatore was based on a sample size of 125 respondents, chosen through descriptive sampling. The study was carried out over a period of five months, from December to April. Primary data were collected through questionnaires administered through Google Forms, and secondary data were collected from relevant articles. The target was consumers in the city of Coimbatore to learn about their perceptions and awareness regarding edible packaging. Statistical aids like percentage analysis, Chi-square test, ANOVA, and T-test were used for analysis of data to gain meaningful insights and justify the research aims.

RESULTS & FINDINGS:

AGE	FREQUENCY	PERCENT
below 18	3	5.4
18 - 30	90	72.0
31 - 40	13	10.4
41 - 50	10	8.0
51 - 60	1	8
60+	3	2.4
Total	125	100.0

GENDER	FREQUENCY	PERCENT
MALE	49	39.2
FEMALE	76	60.8
TOTAL	125	100.0

EDUCATIONAL QUALIFICATION	FREQUENCY	PERCENT
SCHOOLING	9	7.2
UNDERGRADUATE	44	35.2
POSTGRADUATE	56	52.8
PhD	5	4.8
TOTAL	125	100

DESIGNATION	FREQUENCY	PERCENT
STUDENT	52	49.6
EMPLOYEE	47	37.6
HOME MAKER	10	8.0
SELF EMPLOYED	5	4.8
TOTAL	125	100.0

FAMILY MONTHLY INCOME	FREQUENCY	PERCENT
Rs.25,000	34	27.2
26,000 to 35,000	12	9.6
36,000 to 45,000	20	16.0
46,000 to 55,000	16	12.8
Above Rs.55,000	43	34.4
Total	125	100.0

ANALYSIS:

1. TO EXAMINE CONSUMER AWARENESS AND PERCEPTION TOWARDS EDIBLE PACKAGING

SIGNIFICANT RELATION BETWEEN AGE AND BELIEF THAT EDIBLE PACKAGING CAN BE A GOOD ALTERNATIVE.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age * Do you believe edible packaging can be a good alternative to plastic packaging?	125	100.0%	0	0%	125	100.0%

Age * Do you believe edible packaging can be a good alternative to plastic packaging?

Cross tabulation

Count					
		Do you believe edible packaging can be a good alternative to plastic packaging?			
		Yes, it's a great alternative	Maybe, but there are some concerns	No, it's not a good alternative	don't know enough to judge
					Total
Age below 18	4	2	2	0	8
18 - 30	51	24	7	8	90
31 - 40	9	1	2	1	13
41 - 50	3	4	0	3	10
51 - 60	0	1	0	0	1
50+	2	1	0	0	3
Total	69	33	11	12	125

HYPOTHESIS:

H0: There is no significant relation between age and belief that edible packaging can be a good alternative.

H1: There is significant relation between age and belief that edible packaging can be a good alternative.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.800 ^a	15	.331
Likelihood Ratio	17.153	15	.310
Linear-by-Linear Association	.343	1	.558
N of Valid Cases	125		

a. 18 cells (75.0%) have expected count less than 5. The minimum expected count is .09.

INTERPRETATION:

This analysis is conducted to find the relation between the age and belief that edible packaging can be a good alternative. As per the table 4.6 the result of Pearson chi-square test is 16.800 with the significant value of 0.331 which is above the threshold of 0.05. As a result it indicates there is no significant relation between age and belief that edible packaging can be a good alternative.

Therefore the null hypothesis is accepted and the alternative hypothesis is rejected.

2. TO IDENTIFY BARRIERS TO CONSUMER ADOPTION: BARRIERS OF EDIBLE PACKAGING.

T TEST

SIGNIFICANT RELATION BETWEEN GENDER AND RESPONDENTS CHOICE OF PRODUCTS WITH EDIBLE PACKAGING OVER TRADITIONAL PACKAGING.

Group Statistics

Gender	N	Mean	Std. Deviation	Std. Error Mean
How likely would you be Male to choose products with edible packaging over traditional packaging?	49	2.0612	.92214	.13173
Female	76	2.1447	1.01593	.11653

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	df	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
How likely would you be to choose products with edible packaging over traditional packaging?	552	459	465	1.23	0.643	-.08351	17962	-.43906	27203
Equal variances assumed			475	109.574	0.636	-.08351	17588	-.43208	26506
Equal variances not assumed									

(Source: Primary Data)

INTERPRETATION:

It is inferred from the above table 4.17 that the respondents who are female (2.1447) have high mean score for the respondents choice of products with edible packaging over traditional packaging and who are male (2.0612) have low mean score for respondents choice of products with edible packaging over traditional packaging. From the above table 4.17 the significant value relation between gender and respondents perception on edible food packaging for food products is 0.643 which is more than the threshold limit of 0.05. Hence, the null hypothesis is accepted where there is no significant relation between gender and respondents choice of products with edible packaging over traditional packaging.

3. To EVALUATE CONSUMER WILLINGNESS TO PAY A PREMIUM FOR FOOD PRODUCTS PACKAGED IN EDIBLE MATERIAL DUE TO SUSTAINABILITY OR HEALTH BENEFITS.

SIGNIFICANT RELATION BETWEEN FAMILY MONTHLY INCOME AND PAYING HIGHER PRICE FOR PRODUCT PACKAGED IN EDIBLE MATERIAL

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Family Monthly Income * When considering food products packaged in edible materials, which of the following would make you more likely to pay a higher price for them?	125	100.0%	0	0%	125	100.0%

Family Monthly Income * When considering food products packaged in edible materials, which of the following would make you more likely to pay a higher price for them? Cross tabulation

Count		When considering food products packaged in edible materials, which of the following would make you more likely to pay a higher price for them?					Total
		If the product is locally produced and supports local businesses	If the packaging is made from organic or natural ingredients	If the product is from a brand I trust and already use	4	5	
Family Monthly Income	Rs.25,000	6	14	6	8	0	34
	26,000 to 35,000	7	3	1	1	0	12
	36,000 to 45,000	10	5	5	0	0	20
	46,000 to 55,000	9	3	2	2	0	16
	Above Rs.55,000	15	16	6	5	1	43
Total		47	41	20	16	1	125

Hypothesis:

H0: There is no significant relation between family monthly income and paying higher price for product packaged in edible material.

H1: There is significant relation between family monthly income and paying higher price for product packaged in edible material.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.398 ^a	16	.249
Likelihood Ratio	22.142	16	.139
Linear-by-Linear Association	1.595	1	.207
N of Valid Cases	125		

a. 14 cells (56.0%) have expected count less than 5. The minimum expected count is .10.

INTERPRETATION:

This analysis is conducted to find the relation between the gender and factors influencing decision to use edible packaging. As per the table 4.10 the result of Pearson chi-square test is 19.398 with the significant value of which is 0.249 above the threshold of 0.05. As a result it indicates there is no significant relation between family monthly income and paying higher price for product packaged in edible material

Therefore, the null hypothesis is accepted and the alternative hypothesis is rejected.

4. TO DETERMINE THE LEVEL OF CONSUMER INTEREST IN EDIBLE PACKAGING FOR SPECIFIC FOOD CATEGORIES E.G. - SNACKS, BEVERAGES, FAST FOOD AND ITS POTENTIAL MARKET APPEAL.

SIGNIFICANT RELATION BETWEEN EDUCATION AND PURCHASING OF PRODUCT IF THE PACKAGING COULD BE CONSUMED BY ANIMALS.

Multiple Comparisons

How likely would you be to buy a product packaged in edible materials if the packaging could be consumed by animals (e.g., pet food, livestock products)?

Tukey HSD

(I) Education \ (J) Education	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
				Lower Bound	Upper Bound	
Schooling	Undergraduate	.06313	.38288	.998	-.10606	.9343
	Postgraduate	.16162	.37188	.972	-.11304	.8072
	PhD	.55556	.55159	.746	-.19925	.8814
Undergraduate	Schooling	-.06313	.38288	.998	-.9343	1.0606
	Postgraduate	-.09848	.20369	.963	-.6291	.4321
	PhD	-.49242	.45546	.702	-1.6789	.6941
Postgraduate	Schooling	-.16162	.37188	.972	-.8072	1.1304
	Undergraduate	-.09848	.20369	.963	-.4321	.6291
	PhD	-.39394	.44626	.814	-1.5565	.7686
PhD	Schooling	.55556	.55159	.746	-.8814	1.9925
	Undergraduate	.49242	.45546	.702	-.6941	1.6789
	Postgraduate	.39394	.44626	.814	-.7686	1.5565

ANOVA

How likely would you be to buy a product packaged in edible materials if the packaging could be consumed by animals (e.g., pet food, livestock products)?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.499	3	.500	.456	.713
Within Groups	132.533	121	1.095		
Total	134.032	124			

INTERPRETATION:

From the above table 4.11 the significant value relation between education and purchasing of product if the packaging could be consumed by animals is 0.713 which is greater than the threshold limit of 0.05. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected where there is no significant relation between education and purchasing of product if the packaging could be consumed by animals.

FINDINGS

PERCENTAGE ANALYSIS

- **AGE OF RESPONDENTS:** 72.0% of the respondents were in the age category of 18-30 years.
- **GENDER:** 60.8% of the respondents were female.
- **EDUCATIONAL QUALIFICATION:** 52.8% of the respondents were postgraduate.
- **DESIGNATION:** 49.0% of the respondents were students.
- **FAMILY MONTHLY INCOME:** 27.2% of the respondent's family monthly income was up to Rs.25000.

CHI SQUARE TEST

- There is no significant relation between age and belief that edible packaging can be a good alternative. Therefore the null hypothesis is accepted.
- There is no significant relation between gender and factors influencing decision to use edible packaging. Therefore the null hypothesis is accepted.
- There is no significant relation between the education and concerns of consuming food that is wrapped in edible packaging. Therefore the null hypothesis is accepted.
- There is no significant relation between designation and opinion on biggest barrier of adopting edible packaging in food industry. Therefore the null hypothesis is accepted.
- There is no significant relation between family monthly income and paying higher price for product packaged in edible material. Therefore the null hypothesis is accepted.

ONE WAY ANOVA

- There is no significant relation between education and purchasing of product if the packaging could be consumed by animals. Hence, the null hypothesis is accepted.
- There is no significant relation between family monthly income and purchase of a snack with edible packaging if it offered a unique eating experience. Hence, the null hypothesis is accepted.
- There is no significant relation between designation and food categories that respondents would be most interested in seeing with edible food packaging. Hence the null hypothesis is accepted.

T-TEST

- The respondents have not been varied significantly in their mean score for factors that would make edible packaging more appealing to respondents when they are classified based on gender groups. Therefore the null hypothesis has been accepted.
- The respondents have not been varied significantly in their mean score for buying a product packaged in edible material if the packaging could be consumed by animals when they are classified based on gender groups. Therefore the null hypothesis has been accepted.
- The respondents have been varied significantly in their mean score for respondent's perception on edible food packaging for food products when they are classified based on gender groups. Therefore the null hypothesis has been rejected.

- The respondents have not been varied significantly in their mean score for the respondents choice of products with edible packaging over traditional packaging when they are classified based on gender groups. Therefore, the null hypothesis has been accepted.

CONCLUSION:

It can be inferred based on the information gathered and examined that the use of edible packaging is becoming well-known among the consumers in Coimbatore, especially the young and educated population. From the demographic analysis, it appears that a huge percentage of the respondents (72.0%) fall in the age group 18-30 years, where 60.8% of them are female and 52.8% possess a postgraduate degree. Almost half of the respondents (49.0%) are students, and 27.2% come from families with a monthly income of up to Rs. 25,000. This suggests that the main audience with interest or awareness towards edible packaging is young, educated, and price-sensitive.

The statistical tests that were performed—Chi-Square, ANOVA, and T-Test—indicate that demographic factors (age, gender, education, designation, income) have no significant relationship with aspects of edible packaging like believing it to be a feasible alternative, being willing to pay extra, or being concerned about consumption. These results indicate that consumer perceptions of edible packaging are quite uniform across various groups, with the only exception being gender, for which a large difference was seen in how edible food packaging is perceived.

This means that gender could affect how edible packaging is perceived in terms of suitability or attractiveness, but not necessarily in terms of purchasing behavior or adoption intention.

Emphasis needs to be on awareness generation, enhancing packaging quality, maintaining hygiene, and competitive pricing. Though the idea has potential among young people in Coimbatore, safety guarantees and cheap production are the parameters to ensure broad consumer confidence and acceptance.