

Proceeding Paper

# Factors Influencing Consumer Receptivity to Sustainable Packaging: A Probit Regression Analysis <sup>†</sup>

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**Abstract:** The objective of this study is to investigate whether specific socioeconomic and attitudinal factors impact consumer receptivity to sustainable food packaging, with a particular focus on edible cups. A total of 1028 respondents completed an online questionnaire, and the data were analyzed using descriptive analysis and binary probit regression. The results reveal that demographic factors, such as household size and household economic position, have a positive influence on consumers' intention to consume edible packages. Additionally, attitudinal factors were found to be significant, with food technology neophobia negatively affecting consumers' willingness to try edible cups, while beliefs about the development of the sustainable packaging industry positively influence intention.

**Keywords:** sustainable packaging; edible cups; consumption intention; food technology neophobia scale

## 1. Introduction

The increasing concern for environmental sustainability and the need to reduce plastic waste have prompted researchers and food industry professionals to explore sustainable food packaging options. Sustainable food packaging aims to minimize the negative impact on the environment throughout the packaging's life cycle, including its sourcing, manufacturing, use, and disposal. As the demand for eco-friendly packaging grows, it becomes crucial to understand the factors that influence consumers' receptivity towards sustainable packaging. This paper aims to investigate the various demographic and attitudinal factors that play a role in shaping consumers' intention to adopt and consume environmental-friendly packaging options, such as edible cups, using a binary probit regression analysis.

Previous studies show that consumers have positive attitudes towards biodegradable materials [1] and they highlight positive attitudes towards sustainable packaging alternatives, including edible packaging [2]. Moreover, the literature indicates a positive willingness to pay for more environmentally friendly food containers made from biodegradable materials and sustainable packaging, in general [3,4]. Furthermore, consumer preferences towards eco-friendly and edible packaging may vary based on individual characteristics such as gender, age, education, and household size [5] as well as personal norms, attitudes, and environmental concerns [6].

The findings of this study highlight the importance of considering both demographic and attitudinal factors in understanding consumers' intention to adopt and consume edible cups as a sustainable packaging option, emphasizing the importance of targeted strategies. In the next section, we present our data collection and questionnaire design. We then present our results, and conclude with a discussion of our findings in the last section.



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## 2. Materials and Methods

Survey data were collected electronically using an appropriately structured questionnaire. The questionnaire was created on the Google Forms platform, due to the recent COVID-19 pandemic, and was sent to a random sample of consumers during November 2020. The questionnaire was successfully completed by a total of 1028 consumers.

We created a questionnaire where at the beginning subjects were asked whether they knew what edible food packaging is. After this, all subjects, regardless of their response to the previous question, received information related to sustainable and edible packaging, and they were asked whether they are willing to consume (yes or no) an edible coffee cup produced from natural grain products. Besides the standard demographic information (age, gender, education, household size, and income level), the questionnaire also assessed the respondents' fear of novel food technology that was evaluated by applying the Food Technology Neophobia (FTN) scale [7].

We applied a binary probit model to reveal the demographic and attitudinal characteristics of those who are more likely to consume edible cups. The dependent variable for the probit analyses was the binary choice responses to the edible cup consumption question, where a positive answer was taken as 1 and a negative as 0.

## 3. Results

Beginning with the descriptive analysis, we initially assess the profile of our sample by considering a variety of observable characteristics of the subjects. The sample predominantly consists of younger participants, with a majority being female. Furthermore, a significant portion of the sample is pursuing a university degree. The reported household economic position falls within the average range. Lastly, many of the participants are familiar with the concept of edible packaging and hold the belief that the sustainable packaging industry will experience growth in the near future.

As for the FTN scale, the measured scores ranged from 14 to 91, with an average score of 45.27. The higher the score on this scale, the more likely it is the person to be afraid to consume foods produced by novel food technologies. Figure 1 provides additional insight, showing that the scores are clustered around and below the median. This suggests that a significant portion of the sample can be categorized as food technology neophilic, indicating a higher tendency towards openness and acceptance of new food technologies.

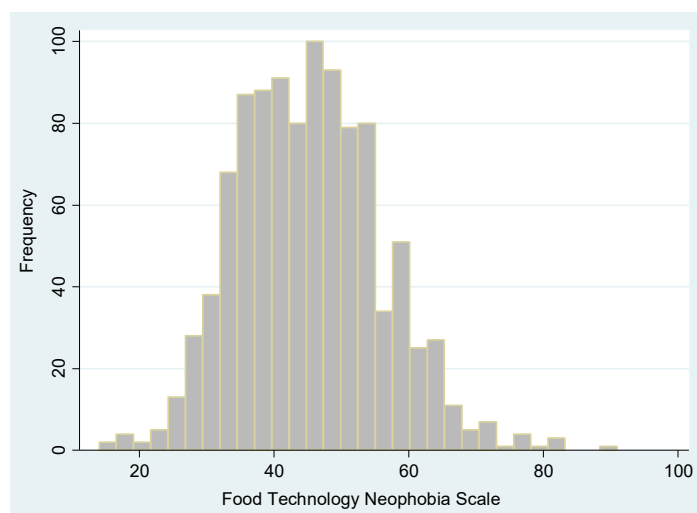


Figure 1. Distribution of WTP responses.

Table 1 presents the results from the estimated probit regression analysis. The likelihood ratio chi-square value of 56.55, with a *p*-value of zero, indicates that our model is statistically significant, suggesting that it fits significantly better than a model with no

predictors. Regarding demographic characteristics, age, gender, and education do not have systematic effects on consumers’ intention to taste edible cups made from natural grain products. However, household size has a positive and statistically significant effect, suggesting that consumers belonging to larger families are more likely to have the intention to consume edible cups. Additionally, a good household economic position increases the probability of consuming edible cups compared to a very bad economic position.

Regarding attitudinal factors, both food technology neophobia and beliefs about the development of sustainable packaging industry play significant roles in shaping consumers’ behavior and their acceptance of innovative and sustainable packaging options, like edible cups. Specifically, for each one-unit increase in the Food Technology Neophobia scale, the z-score decreases by 0.01, indicating that consumers who are more afraid of new technologies in food production are less likely to try an edible cup. On the other hand, consumers who believe in the growth and advancement of the sustainable packaging industry in the near future are more likely to have the intention to consume edible cups.

**Table 1.** Binary probit model estimates.

	Coefficients	Standard Errors
Constant	0.27	(0.74)
Age	−0.01	(0.01)
Gender	−0.1	(0.14)
Household size	0.17 **	(0.07)
Household’s economic position		
Bad	0.35	(0.37)
Average	0.45	(0.33)
Good	0.71 **	(0.35)
Very good	0.65	(0.45)
Education level		
University student	0.45	(0.41)
University graduate	0.32	(0.42)
Master/Ph.D. student	0.68	(0.43)
Master/Ph.D. graduate	0.25	(0.44)
Knows about edible food packaging	−0.11	(0.14)
FTN scale	−0.01 **	(0.01)
Development of sustainable packaging industry in the near future	0.8 ***	(0.15)
N		1028
Chi-square		56.55
Prob > chi2		0.00

Notes: \*\* < 0.05, \*\*\* < 0.01.

#### 4. Discussion and Conclusions

This study sheds light on the complex interplay between demographic characteristics and attitudinal factors in shaping consumers’ intention to consume a sustainable packaging option. The findings have important implications for businesses, policymakers, and marketers seeking to promote sustainable packaging practices, enabling them to identify consumer segments willing to consume edible cups. By recognizing the significance of individual characteristics and addressing consumers’ concerns related to food technology neophobia, businesses can better target their marketing efforts and design strategies to increase the adoption of edible cups.

While this study contributes to the understanding of consumer behavior regarding edible cups, it is important to note some limitations. The sample used is not representative, and the design could be further extended to include other sustainable packaging options. Future studies could consider factors such as cultural influences, pricing strategies, and

sensory experiences to gain a more comprehensive understanding of consumers' acceptance and adoption of edible cups. Despite these limitations, our findings can be considered as a first perspective on consumer receptivity for edible cups in Greece, which may foster future studies in this field.

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**Conflicts of Interest:** The authors declare no conflicts of interest.

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