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RESEARCH ARTICLE

ACCEPTANCE OF THE USAGE OF RICE-BASED STRAWS AMONG THE STUDENTS OF LYCEUM OF THE PHILIPPINES UNIVERSITY

Authors: **Patricia Kim Gascon[1*], Aliyah Jhoy V. Ganarial[2], Ruth Patrice R. Estrella[3], Reymalyn E. Gomez[4], Issa Mae R. Namuag[5], & Ivan L. Bartolata[6]**

Email: namuagissamae468@gmail.com[1]
Affiliation: Lyceum of the Philippines University – Cavite, Philippines[1-6]

Abstract

This study assessed the acceptance of rice-based straws among students of Lyceum of the Philippines University–Cavite as a sustainable alternative to plastic straws. Specifically, the study examined students' perceptions in terms of durability, sustainability, usability, advantages, and limitations of rice-based straws. A quantitative descriptive research design was employed, utilizing a researcher-made survey questionnaire administered to 381 undergraduate students from the College of International Tourism and Hospitality Management, the College of Liberal Arts and Education, and the College of Nursing. Data were analyzed using frequency distribution, percentage, weighted mean, and standard deviation through the Statistical Package for the Social Sciences (SPSS). Findings revealed that respondents generally expressed a positive acceptance of rice-based straws. In terms of durability, rice-based straws obtained a grand mean of 4.25, interpreted as "Agree," indicating that the straws were perceived to maintain their functionality throughout beverage consumption. Sustainability recorded the highest grand mean of 4.52, interpreted as "Strongly Agree," demonstrating that students recognized rice-based straws as environmentally friendly alternatives capable of reducing plastic waste. Usability also received a favorable evaluation, with a grand mean of 4.37, interpreted as "Agree," suggesting that respondents considered rice-based straws practical and convenient for everyday use. Among the perceived advantages, "eco-friendly and reduces plastic waste" ranked highest with 30.5%, while "limited availability or options" emerged as the primary disadvantage with 37.4%. Overall, the findings suggest that students perceive rice-based straws as a viable and sustainable alternative to conventional plastic straws, despite concerns regarding accessibility and market availability.

Keywords: *rice-based straws, sustainability, plastic pollution, eco-friendly alternatives, consumer acceptance, university students*

Introduction

Plastic pollution has become a pressing environmental concern worldwide, particularly in developing countries such as the Philippines, where single-use plastics significantly contribute to solid waste accumulation. According to Cariaso (2023), plastic materials account for a substantial proportion of the country's daily waste generation, posing serious threats to marine ecosystems, public health, and environmental sustainability. Among these single-use plastics, drinking straws are widely utilized in food and beverage establishments because of their convenience and accessibility. Despite their small size, plastic straws contribute considerably to environmental degradation because they are difficult to recycle and are frequently discarded improperly, allowing them to enter waterways and oceans (Eriksen et al., 2014). Consequently, increasing environmental awareness has intensified the search for sustainable and biodegradable alternatives to conventional plastic straws.

In response to the growing concern regarding plastic pollution, several eco-friendly alternatives such as paper, bamboo, silicone, and edible straws have emerged in the market. However, many of these alternatives present limitations related to durability, cost, accessibility, and disposal requirements. Paper straws, for instance, are often criticized for becoming soggy during use and may still require industrial composting systems for proper decomposition (Pros and Cons of Paper Straws, 2020). Rice-based straws have recently gained attention as a promising sustainable alternative because they are biodegradable, compostable, edible, and manufactured using natural ingredients such as rice flour and tapioca starch (Ha, 2023). Developed initially in Asian countries such as South Korea and Vietnam, rice straws are designed to maintain structural integrity while reducing environmental impact through natural decomposition

processes (Ilbo, 2019). Their increasing popularity reflects the growing global demand for environmentally responsible consumer products.

Existing studies emphasize the environmental and functional advantages of rice-based straws. Rai et al. (2024) reported that rice-straw-derived drinking straws possess significantly lower global warming potential compared with conventional plastic and paper straws, supporting their viability within circular economy frameworks. Similarly, Putri and Fallah (2022) found that biodegradable straws produced from unused rice and rice bran can decompose naturally within a few days while maintaining sufficient durability for practical use. Furthermore, Lalonde (2019) explained that rice-based straws exhibit greater resistance to liquid absorption than paper straws, allowing them to retain usability for longer periods. These findings suggest that rice-based straws can serve as an effective sustainable substitute for single-use plastics while simultaneously supporting waste reduction and resource reutilization practices.

Consumer acceptance plays a critical role in determining the successful adoption of sustainable products. Young consumers, particularly university students, are increasingly recognized as influential drivers of environmentally responsible behavior because of their openness to innovation and heightened awareness of environmental issues. Lopes et al. (2024) noted that Generation Z consumers demonstrate stronger preferences for green products and sustainable consumption practices compared with previous generations. Likewise, Kuźniar et al. (2021) emphasized that university students' environmental attitudes and behavioral intentions significantly influence their willingness to adopt eco-friendly alternatives. In academic institutions, where single-use plastics remain prevalent in daily consumption practices, students represent an important demographic for evaluating the acceptance and practicality of sustainable products such as rice-based straws.

Despite the growing body of literature on biodegradable and edible straws, studies focusing specifically on rice-based straws remain limited, particularly within the context of higher education institutions in the Philippines. Existing research predominantly concentrates on the environmental properties and production processes of rice straws, with insufficient attention given to users' perceptions regarding durability, sustainability, usability, and accessibility. Moreover, limited empirical evidence exists concerning the acceptance of rice-based straws among Filipino university students, whose consumption behaviors may significantly influence future sustainable practices within educational communities. Addressing this research gap is essential in understanding whether rice-based straws can realistically serve as a practical alternative to plastic straws in local settings.

Therefore, this study aims to assess the acceptance of rice-based straws among students of Lyceum of the Philippines University–Cavite in terms of durability, sustainability, and usability. Specifically, the study seeks to examine students' perceptions regarding the advantages and limitations of rice-based straws as an environmentally friendly alternative to conventional plastic straws. The findings of this research may contribute to the growing discourse on sustainable consumption practices and provide valuable insights for educational institutions, manufacturers, and policymakers promoting eco-friendly innovations to reduce plastic pollution.

Research Objectives

The study aims to assess the acceptance of rice-based straws among students of Lyceum of the Philippines University–Cavite in terms of durability, sustainability, usability, advantages, and limitations as an alternative to plastic straws. Specifically, this study sought:

1. To assess the practicality, convenience, and efficiency of rice-based straws among students, focusing on their overall acceptance and potential as an alternative to plastic straws.
2. To evaluate the durability of rice-based straws in different applications, such as drinking various beverages.
3. To identify the benefits of using rice-based straws, including environmental impact and ease of use.
4. To determine the limitations of rice-based straws, including availability, accessibility, and overall effectiveness.
5. To assess students' perceptions and level of acceptance of rice-based straws in terms of usability, sustainability, and practicality.
6. To provide recommendations on the adoption of rice-based straws based on students' feedback and observed advantages and disadvantages.

Literature Review

Environmental Sustainability and Plastic Waste Reduction

The growing environmental crisis caused by single-use plastics has intensified the demand for sustainable alternatives, particularly in the food and beverage industry. Plastic straws are among the most common contributors to marine and land pollution because of their widespread usage and low recyclability (Eriksen et al., 2014). Studies consistently highlight that rice-based straws provide a more sustainable alternative because they are biodegradable, compostable, and produced using natural ingredients such as rice flour and tapioca starch (Ha, 2023). Rai et al. (2024) further emphasized that rice-straw-derived products possess significantly lower environmental impacts compared with plastic and paper straws, particularly in terms of greenhouse gas emissions and waste generation. These findings support the potential of rice-based straws to contribute to environmental conservation and sustainable consumption practices.

Functional Performance and Durability of Rice-Based Straws

The practical usability of eco-friendly straws remains an important consideration influencing consumer acceptance. Previous literature indicates that many consumers express dissatisfaction with paper straws because they soften quickly and lose structural integrity during

use (Pros and Cons of Paper Straws, 2020). In contrast, rice-based straws demonstrate improved durability and functionality, allowing them to maintain their form for extended periods when immersed in beverages (Lalonde, 2019). Vu (2024) explained that the manufacturing process of rice straws enhances their stability and resistance to moisture, making them more practical for everyday consumption. Similarly, Putri and Fallah (2022) reported that rice-based biodegradable straws possess sufficient strength while remaining capable of natural decomposition. These studies suggest that rice-based straws may address the durability limitations associated with other sustainable straw alternatives.

Consumer Acceptance and Sustainable Consumption Behavior

Consumer perceptions and behavioral intentions significantly influence the adoption of environmentally sustainable products. Young consumers, particularly university students, are increasingly associated with environmentally conscious purchasing decisions and support for sustainable innovations (Lopes et al., 2024). Kuźniar et al. (2021) noted that students' environmental awareness, peer influence, and openness to innovation contribute to their willingness to adopt eco-friendly products. Moreover, studies on sustainable consumption reveal that consumers are more likely to support products perceived as both environmentally beneficial and functionally effective. In the context of rice-based straws, acceptance is influenced not only by environmental awareness but also by perceptions of usability, accessibility, and convenience. Consequently, understanding students' attitudes toward rice-based straws is essential in evaluating the feasibility of promoting such alternatives within educational institutions and broader consumer markets.

Methodology

Research Design

This study employed a quantitative descriptive research design to examine the level of acceptance of rice-based straws among students of Lyceum of the Philippines University–Cavite. Quantitative descriptive research is appropriate for studies that aim to systematically measure attitudes, perceptions, and behaviors through numerical data and statistical analysis. The study focused on assessing students' perceptions of rice-based straws in terms of durability, sustainability, usability, advantages, and limitations as a potential alternative to plastic straws. A total of 381 students participated in the study, exceeding the initial target population due to the high response rate during data collection. The respondents were selected from the College of International Tourism and Hospitality Management, College of Nursing, and College of Liberal Arts and Education to ensure diverse academic representation within the university. The selection of university students was supported by the Theory of Planned Behavior and the Diffusion of Innovations Theory, which suggest that young individuals are more likely to adopt environmentally sustainable practices because of their openness to innovation, environmental awareness, and social influence (Kuźniar et al., 2021; Sundström & Oikarinen, 2020). Considering that students are frequent users of single-use plastics, they constitute a relevant population for evaluating the acceptability of sustainable alternatives such as rice-based straws.

Participants

The participants of the study consisted of 381 undergraduate students enrolled at Lyceum of the Philippines University–Cavite during the Academic Year 2024–2025. Respondents were selected using convenience sampling based on their accessibility and willingness to participate in the study. The participants were drawn from three colleges within the university, namely the College of International Tourism and Hospitality Management, College of Liberal Arts and Education, and College of Nursing. The inclusion criteria required participants to be currently enrolled students who had actual experience using the rice-based straws distributed during the study. Students who voluntarily agreed to participate and completed the survey questionnaire were included in the final dataset. The majority of participants belonged to the 18–24 age group, which is considered highly relevant in sustainability-related studies because young adults are increasingly associated with environmentally conscious behaviors and support for sustainable consumption practices. The selection of students as respondents was further justified by existing literature emphasizing the significant role of youth in influencing sustainable consumer behavior and environmental advocacy (Lopes et al., 2024).

Instruments

The study utilized a researcher-made survey questionnaire designed to assess the acceptance of rice-based straws among university students. The instrument was developed based on the objectives of the study and relevant literature concerning sustainable products and eco-friendly alternatives to plastic straws. Prior to data collection, the questionnaire underwent content validation by the research adviser and faculty members with expertise in tourism and hospitality research to ensure clarity, relevance, and appropriateness of the items. The questionnaire consisted of three major sections. The first section gathered the demographic profile of the respondents, including age, sex, year level, and academic program. The second section measured the participants' level of acceptance of rice-based straws in terms of durability, sustainability, and usability using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The third section identified the perceived advantages and disadvantages of rice-based straws through checklist items and frequency-based responses. The instrument was designed to generate quantitative data that would allow the researchers to analyze patterns in students' perceptions and determine the viability of rice-based straws as a sustainable alternative to conventional plastic straws.

Procedure

The data collection process was conducted from August 2024 to May 2025, with the primary survey administration organized in April 2025. Prior to the conduct of the study, permission was secured from appropriate university authorities to administer the survey within the campus premises. The researchers personally distributed rice-based straws to selected students at beverage stalls and kiosks inside the university to ensure that all participants had firsthand experience using the product before answering the questionnaire. The respondents used the rice-based straws immediately after receiving their purchased beverages, such as coffee, milk tea, shakes, and other drinks. During the process, the researchers supervised the actual usage of the straws and observed the participants for several minutes to verify authentic product interaction and ensure the reliability of responses. After using the rice-based straws, the participants accessed the survey questionnaire through a QR code linked to a Google Forms platform. The questionnaire focused on evaluating the respondents' perceptions regarding the durability, sustainability, usability, advantages, and limitations of the rice-based straws. Upon retrieval of the responses, the researchers reviewed the completed questionnaires to ensure completeness, consistency, and accuracy of the collected data before proceeding to statistical analysis.

Data Analysis

The collected data were analyzed using quantitative statistical techniques through the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequency distribution, percentage, weighted mean, and standard deviation, were employed to summarize and interpret the demographic characteristics of the respondents and their level of acceptance of rice-based straws. The five-point Likert scale was used to interpret participants' responses, with corresponding verbal interpretations ranging from "Strongly Disagree" to "Strongly Agree." Weighted mean scores were utilized to determine the overall acceptance of rice-based straws in terms of durability, sustainability, and usability. Frequency counts and percentage distributions were also applied to identify the perceived advantages and disadvantages of rice-based straws. The statistical analyses enabled the researchers to identify patterns, trends, and general perceptions among respondents regarding the feasibility of rice-based straws as a sustainable alternative to plastic straws. All statistical interpretations were conducted objectively to ensure the accuracy, reliability, and validity of the study findings.

Ethical Considerations

The study strictly adhered to established ethical principles to protect the rights, welfare, and confidentiality of all participants throughout the research process. Prior to participation, respondents were informed about the objectives, procedures, and significance of the study, and informed consent was obtained from each participant. Participation was entirely voluntary, and respondents were assured that they could withdraw from the study at any point without penalty or consequence. To maintain confidentiality and anonymity, no personally identifiable information was collected in the questionnaire, and all responses were used solely for academic and research purposes. The researchers ensured compliance with the Data Privacy Act of 2012 by implementing appropriate measures to safeguard the collected data against unauthorized access, disclosure, or misuse. Furthermore, the study upheld principles of integrity, transparency, and objectivity throughout the data collection, analysis, and reporting processes to ensure the credibility and ethical soundness of the research.

Results and Discussion

This section presents the findings and interpretations of the study regarding the acceptance of rice-based straws among students of Lyceum of the Philippines University–Cavite. The results are organized according to the demographic profile of the respondents and their level of acceptance in terms of durability, sustainability, and usability, as well as the perceived advantages and disadvantages of rice-based straws. Statistical data are analyzed and interpreted using relevant literature and related studies to provide a comprehensive understanding of students' perceptions toward rice-based straws as a sustainable alternative to plastic straws.

Table 1. *Age Distribution of Participants*

Age	*F*	*%*	*Rank*
18 – 24	367	96.3	1
25 and above	14	3.7	2
Total	381	100	

Table 1 presents data on age demographics. The highest frequency is in the 18-24 age group, with 367 participants, or 96.3 percent. Conversely, the 25 and above age group ranks last, with a frequency of 14, or 3.7 percent. The total number of participants is 381.

The findings indicate that the majority of students at Lyceum of the Philippines University–Cavite fall within the 18-24 age range. This demographic is often characterized as broad-minded, possessing diverse perspectives, and demonstrating a willingness to embrace new ideas. As noted by UNICEF (2023), societal perspectives can vary as young people become more aware of global crises. Youth are increasingly opting for eco-friendly products and activities to foster environmental change, leading to greater involvement in socio-environmental issues. According to the Philippine Statistics Authority (2023), 47.3 percent of individuals aged 20–24 in the household population have attained or completed at least a college education, indicating that this age group constitutes a significant portion of the

college population in the Philippines. Furthermore, Reyes (2023) states that approximately 75 percent of undergraduates are between the ages of 18 and 24.

Table 2. *Sex Distribution of Participants*

Sex	*F*	*%*	*Rank*
Male	122	32	2
Female	259	68	1
Total	381	100	

Table 2 presents the participants' sex. The highest representation is of females, with a frequency of 259, accounting for 68 percent of the total. In contrast, "Males" ranks last, with a frequency of 122, or 32. The total number of participants is 381. The results indicate a higher representation of females in the study. As of December 2023, the latest figures from the Commission on Higher Education (CHED) reveal that women now outnumber men in college education, with 2.74 million women, representing 57.2 percent of total enrollees (Malaya Business Insight, 2024). Additionally, during the three-day Pacific Asia Travel Association (PATA) International Conference on Women in Travel, it was noted that over 50 percent of employees in the tourism industry are women (Saavedra, 2024).

Table 3. *Year Level Distribution of Participants*

Year Level	*F*	*%*	*Rank*
First Year	131	34.4	1
Second Year	107	28.1	3
Third Year	119	31.2	2
Fourth Year	24	6.3	4
Total	381	100	

Table 3 shows the year level. First in rank is the first year, with a frequency of 131, or 34 percent. It was followed by a third year, with a frequency of 119, or 31.2 percent. Third in rank is the second year, with a frequency of 107, or 28.1 percent. Last in rank is the fourth year, with a frequency of 24, or 6.3 percent. It interprets the result as indicating that freshmen are the most active participants in the given study when compared to those in higher year levels, showing a noticeably greater level of involvement and representation among the participants.

Table 4. *Program Distribution of Participants*

Program	*F*	*%*	*Rank*
College of International Tourism and Hospitality Management	249	65.4	1
College of Nursing	56	14.7	3
College of Liberal Arts and Education	76	19.9	2
Total	381	100	

Table 4 shows the program. First in rank is the College of International Tourism and Hospitality Management with a frequency of 249, or 65.4 percent. It was followed by the College of Liberal Arts and Education with a frequency of 76, or 19.9 percent. Last in rank is the College of Nursing with a frequency of 56, or 14.7 percent. Based on the table above, the results suggest that the majority of the participants are enrolled in the College of International Tourism and Hospitality Management. Lyceum of the Philippines University has been recognized for outstanding performance in the International

Student Satisfaction Benchmark Survey (ISBSB) Student Satisfaction Survey by the International Center of Excellence in Tourism and Hospitality Education (THE-ICE). This recognition suggests that LPU provides high-quality hospitality and tourism education, strengthening its reputation as a leading organization in tourism education among students (Lyceum of the Philippines University, 2024). According to the Department of Tourism, in 2023, the Philippine Statistics Authority (PSA) recorded that over 6.2 million Filipinos found jobs in the tourism industry by 2022.

Table 5. *Participants' Level of Acceptance of the Durability of Rice-Based Straws*

Durability	*Mean*	*SD*	*Verbal Interpretation*
I find rice-based straws durable enough to last through an entire drink.	4.23	0.00	Agree
I believe that rice-based straws effectively maintain their shape and integrity throughout use.	4.21	0.89	Agree
I found the rice-based straw functional and effective throughout my use.	4.27	0.88	Agree
I am satisfied with the overall durability of rice-based straws.	4.30	0.85	Agree
Grand Mean	4.25	0.79	Agree

Table 5 shows the level of acceptance regarding the "durability" of rice-based straws, with mean scores ranging from "4.21" as the lowest to "4.30" as the highest. The overall mean score of "4.25" is interpreted as "strongly agree," indicating that students from Lyceum of the Philippines University–Cavite strongly affirm the durability of rice-based straws. The statement "I am satisfied with the overall durability of rice-based straws" received the highest mean score of "4.30," while the statement "I believe that rice-based straws effectively maintain their shape and integrity throughout use" received the lowest mean score of "4.21." Both statements are interpreted as "agree."

These results contradict existing literature on paper straws, which have been criticized for their lack of durability. The data suggest that all statements were rated as "agree" because, although the students expressed satisfaction with the overall durability of rice-based straws, they are more accustomed to plastic straws, known for their high durability. Consequently, rice-based straws may appear less reliable and stable to the participants, even if they performed adequately. As a result, the data indicate "agree" rather than "strongly agree," suggesting there is still room for improvement in the durability of rice-based straws. For instance, Garcia and Sutton (2025) reported that paper straws often failed completely, leading to customer frustration over the need for multiple straws to finish a drink. Similarly, The Happy Turtle Straw (2024) found that consumers frequently express dissatisfaction due to paper straws becoming soggy and losing their shape during use. The students' high acceptance of rice-based straws implies that these issues may be better addressed by rice-based alternatives, which could provide a more durable and satisfying experience.

Table 6. *Participants' Level of Acceptance of the Sustainability of Rice-Based Straws*

Sustainability	*Mean*	*SD*	*Verbal Interpretation*
I prefer using rice-based straw friendly because they are environmentally friendly and reduce plastic waste.	4.47	0.83	Agree
I believe rice-based straws should be widely adopted as a sustainable option.	4.52	0.76	Strongly Agree
I feel more responsible about my environmental choices when using rice-based straws.	4.51	0.81	Strongly Agree
I believe that rice-based straws are a better environmental alternative to other straws.	4.56	0.76	Strongly Agree
Grand Mean	4.52	0.79	Strongly Agree

Table 6shows the level of acceptance of the "sustainability" of rice-based straws, implying the mean scores ranging from "4.47" as the lowest to "4.56" as the highest are presented. Results have shown that the overall mean of "4.52" is interpreted as "strongly agree." This suggests that students from Lyceum of the Philippines University–Cavite strongly agree to the sustainability of rice-based straws. The statement "Rice-based straws are a better environmental alternative to other straws" has recorded the highest mean score of "4.56" and is interpreted as "strongly agree," while the statement "I prefer using rice-based straws because they are environmentally friendly and reduce plastic waste" received the lowest mean score of "4.47" and is interpreted as "agree."

The data reveal that rice-based straws are a better environmental alternative compared to other straws because they are compostable, biodegradable, and made from natural ingredients. The statement "I believe that rice-based straws are a better environmental alternative to other straws" resulted in "strongly agree" because most students are becoming aware of the impact of plastic straws on the environment, and because of that, they support the idea of using sustainable alternatives. On the other hand, the statement "I prefer using rice-based straws because they are environmentally friendly and reduce plastic waste" only resulted in "agree" because, although individuals recognize that rice straws are eco-friendly and help reduce plastic waste, their preference for using them might be relatively low. This may be because of the issues they personally encountered when using rice-based straws. In relation to the study conducted by some authors (Neo, 2019; Ha, 2023), rice straws are considered eco-friendly and edible since they are made of 100% natural ingredients. Additionally, rice straws decompose completely after two to three months without a trace and without piling up like plastic straws.

Table 7 shows the level of acceptance of the "usability" of rice-based straws, implying the mean scores ranging from "4.32" as the lowest to "4.42" as the highest are presented. Results have shown that the overall mean of "4.37" is interpreted as "agree." This suggests that students from Lyceum of the Philippines University–Cavite agree to the usability of rice-based straws. The statement "I think rice-based straws are a practical choice for replacing traditional plastic straws" has recorded the highest mean score of "4.42" and is interpreted as agree, while the statement "I find rice-based straws easy and convenient to use" received the lowest mean score of "4.32" and is interpreted as agree.

Table 7. *Participants' Level of Acceptance of the Usability of Rice-Based Straws*

Usability	*Mean*	*SD*	*Verbal Interpretation*
I find rice-based straws easy and convenient to use.	4.32	0.85	Agree
I would regularly use rice-based straws if they were readily available.	4.37	0.85	Agree
I think rice-based straws are a practical choice for replacing traditional plastic straws.	4.42	0.79	Agree

I am satisfied with how the rice-based straw performed in terms of its functionality and user-friendliness during my experience.	4.38	0.85	Agree
Grand Mean	4.37	0.83	0.79

As presented in the data, students from Lyceum of the Philippines University – Cavite agree to the usability of rice-based straws. The statement "I think rice-based straws are a practical choice for replacing traditional plastic straws" has recorded the highest mean score of "4.42" and is interpreted as agree, while the statement "I find rice-based straws easy and convenient to use" received the lowest mean score of "4.32" and is interpreted as agree. As presented in the data, rice-based straws could be a practical choice for replacing traditional plastic straws. All statements under usability were rated as "agree" because, although the rice-based straws are usable, there might still be certain disadvantages, such as limited availability or insufficient experience of using straws among the participants. Some students may feel that they need to use the straw frequently to fully evaluate its usability. Additionally, in terms of performance, there may be some factors that need to be improved for the participant to confidently select "strongly agree."

According to the World Species Fund (2020), plastic straws are counted as one of the top five plastic contaminants in Philippine oceans that damage wildlife and contaminate our ecosystems. Since rice straw is biodegradable, it serves as a sensible replacement for plastic; unlike plastic straws that decompose into microplastics, rice straw will undergo natural decomposition. (Kumar et al., 2020).

Table 8. *Participants' Level of Acceptance of the Advantages of Rice-Based Straws*

Advantage	*F*	*%*	*Rank*
Rice-based straws are eco-friendly and reduce plastic waste.	370	30.5	1
Rice-based straws are biodegradable and compostable.	310	25.6	2
Rice-based straws are safe and chemical-free.	266	22.0	3
Rice-based straws add to a sustainable lifestyle.	265	21.9	4
Grand Mean	1211	100	

Table 8 shows the "Advantages." First in rank is the statement, "Rice-based straws are eco-friendly and reduce plastic waste," with a frequency of "370" or "30.5%." It was followed by the statement "Rice-based straws are biodegradable and compostable" with a frequency of "310" or "25.6%." Next in rank is the statement "Rice-based straws are safe and chemical-free" with a frequency of "266" or "22.0%." Last in rank is the statement "Rice-based straws add to a sustainable lifestyle" with a frequency of "265" or "21.9%."

These results are consistent with existing literature on rice-based straws, highlighting their environmental and health benefits. The statement "Rice-based straws are eco-friendly and reduce plastic waste" ranked first because most of the participants are now more aware of eco-friendly products and know that rice-based straws will help reduce plastic waste since rice straws are compostable and biodegradable, limiting the environmental footprint compared to plastic or even conventional paper straws (The Happy Turtle Straw, 2024). In accordance with that, Generation Z is known for being more relationally and environmentally conscious than earlier generations (Lopes et al., 2024). On the other hand, the statement "Rice-based straws add to a sustainable lifestyle" ranked the lowest because some students' perceptions of using rice-based straws may not be as significant, since not all of their daily choices are sustainable. According to Sustainability (2020), using rice-based straws is a small or insignificant action compared to the more significant unsustainable habits they encounter in their daily lives. Additionally, this perception could stem from a lack of awareness about the environmental impact of traditional rice straw disposal methods and the potential benefits of using rice straw for sustainability.

Table9. *Participants' Level of Acceptance of the Disadvantages of Rice-Based straws*

Disadvantage	*F*	*%*	*Rank*
Rice-based straws break or soften easily in drinks.	158	21.13	3
Rice-based straws alter the taste of the beverage.	145	19.4	4
Rice-based straws have limited availability or options.	280	37.4	1
Rice-based straws not suitable for all types of beverages.	165	22.1	2
Grand Mean	748	100	

Table 9 shows the "Disadvantages." First in rank is the statement "Rice-based straws limited availability or options" with a frequency of "280" or "37.4%." It was followed by the statement "Rice-based straws not suitable for all types of beverages" with a frequency of "165" or "22.1%." Next in rank is the statement "Rice-based straws break or soften easily in drinks" with a frequency of "158" or "21.1%." Last in rank is the statement "Rice-based straws alter the taste of the beverage" with a frequency of "145" or "19.4%."

These findings pose significant challenges to the sustainability and availability of rice straws. The statement "Rice-based straws have limited availability or options" ranked the highest for disadvantages due to the limited availability of rice straws in the Philippine marketplace, which has limited public data, product marketing, or commercial sales compared to familiar substitutes, such as paper. At present, ambiguous policies and the absence of incentives create pressure on farmers to adopt sustainable use and management of straw practices (Tiemann & Douxchamps, 2023). Purchasing machinery and technology for processing straw is a financial limitation for many farmers as well. These functional limitations will lend credence to the reasons why the main disadvantages included unsuitability and fragility (Kimecopak, 2025). In accordance with the data, the statement "Rice-based straws alter the taste of the beverage" ranks the

lowest for disadvantages because most participants did not notice a significant change in the flavor of their drinks while using the rice-based straws, which suggests that alteration in the taste of their beverage is not a common concern among the participants. According to USA Rice (2019), rice-based straws do not alter the taste of beverages, unlike paper straws or other sustainable straw alternatives. The reason is that rice-based straws are made with only natural ingredients, and no other chemicals are added.

Conclusion

The study concludes that rice-based straws are positively accepted by students of Lyceum of the Philippines University–Cavite as an environmentally sustainable alternative to plastic straws. The findings demonstrate that respondents generally perceived rice-based straws as durable, usable, and environmentally responsible. The overall acceptance of rice-based straws indicates that university students are increasingly aware of the environmental impacts of single-use plastics and are open to adopting eco-friendly alternatives that contribute to waste reduction and sustainability initiatives.

In terms of durability, the study revealed that respondents agreed that rice-based straws could maintain their shape and functionality throughout beverage consumption, as reflected by the grand mean score of 4.25. Although participants expressed satisfaction with the straws' performance, the findings also suggest that there is still room for improvement in enhancing their structural stability, particularly for prolonged use or varying beverage types. Nevertheless, the results indicate that rice-based straws provide a more favorable experience compared with commonly criticized paper straws, which are often associated with sogginess and reduced functionality.

The sustainability dimension obtained the highest level of acceptance, with a grand mean of 4.52 interpreted as "Strongly Agree." This finding highlights that respondents strongly recognized rice-based straws as environmentally friendly alternatives capable of reducing plastic waste and supporting sustainable consumption practices. Students demonstrated awareness regarding the ecological consequences of plastic pollution and expressed support for biodegradable and compostable products. The findings further emphasize the growing environmental consciousness among young consumers, particularly university students who are increasingly engaged in sustainable behaviors and green consumption practices.

The study also found that respondents agreed with the usability of rice-based straws, with a grand mean of 4.37, indicating that participants considered them practical and convenient for daily use. However, limited availability emerged as the primary disadvantage, suggesting that accessibility remains a significant challenge affecting wider adoption. While respondents acknowledged the environmental and functional benefits of rice-based straws, their limited market presence and availability may hinder consistent consumer use. This finding suggests that sustainable alternatives must not only be environmentally beneficial but also accessible and readily available to consumers to encourage long-term behavioral change.

Based on the findings, the study recommends that educational institutions, food establishments, and local businesses promote the use of rice-based straws as part of sustainability and waste reduction initiatives. Manufacturers and suppliers are encouraged to improve the availability, affordability, and durability of rice-based straws to enhance consumer satisfaction and accessibility. Future researchers may further investigate the long-term effectiveness, economic feasibility, and consumer behavior related to rice-based straws across different demographic groups and settings. Additional studies employing comparative and experimental approaches are also recommended to evaluate rice-based straws alongside other biodegradable alternatives in terms of environmental impact, usability, and consumer preference.

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