



Paper Straws: The New Age Movement or the Same old Consumerism

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Abstract

The current study aims to compare the classic plastic straw with the new paper straw which is meant to be helpful for the environment. The product entered the market with hopes of revolutionizing it and decreasing plastic waste drastically. The comparison entails differential analysis on the aspects of product satisfaction, impact on the environment and overall usefulness of the product. Through the questionnaire circulated and research on the matter, it was observed that paper straws are not that good of a product previously proclaimed to be.

Keywords: Paper straw, differential analysis, plastic waste.

Aim: To conduct a differential analysis between paper straw and plastic straw on accounts of product satisfaction, impact on the environment and overall usefulness.

Introduction

Straws are small cylindrical tubes made from various types of plastic materials, typically used for sipping beverages. The history of straws extends back through the centuries, and it encompasses a wide variety of materials and designs.

Ancient times' straws have been used for centuries, with some of the earliest examples being found in ancient civilizations. Ancient Sumerians, Egyptians, and Chinese are believed to have used straws made from reeds or other plant materials for drinking. These early straws were simple, hollow tubes. In some ancient cultures, straws were crafted from materials like gold, silver, and other precious metals, making them a symbol of luxury and extravagance. These metal straws were often adorned with intricate designs and used by royalty and the elite.

In Colonial America, people used rye stems as drinking straws. These natural, hollow plant stems served as simple and disposable straws. The development of plastic straws followed the rise of the plastics industry in the mid-20th century. Plastic straws became popular in the 1930s and 1940s, initially made from Bakelite, a rigid form of plastic. The advent of flexible plastic straws, created by Joseph B. Friedman in the 1950s, made them more versatile and widely used.

The growth of the fast-food industry in the mid-20th century, with the introduction of drive-thru restaurants and takeout culture, further propelled the use of plastic straws as a convenient, disposable option for serving beverages.

As environmental awareness grew, concerns about the impact of plastic straws on the environment emerged. Plastic straws were found to contribute to plastic pollution, particularly in oceans and waterways. In response, regulations and bans on single-use plastic straws were introduced in various regions. Paper, glass, stainless steel, and bamboo straws became more and more popular as alternatives to plastic straws gained traction. Reusable and biodegradable straws also proliferated.

The shift away from plastic straws also raised concerns about ensuring that individuals with disabilities have access to suitable alternatives, which led to discussions about the need for accessible straw options.

The history of straws reflects changes in materials, design, and societal norms over the centuries. From humble reeds in ancient times to the modern push for sustainable and accessible alternatives, straws have evolved in response to changing consumer preferences and growing environmental awareness.

Plastic Straws

Plastic straws are commonly made from polypropylene or polyethylene plastic. They can also be made from polystyrene or other plastic polymers. Plastic straws come in various sizes, including standard lengths of 5.5 to 7.75 inches (14 to 20 centimeters).

There are different types of plastic straws, including straight straws, flexible straws (often with a bendable neck), and jumbo straws for thicker beverages. Straws made of plastic are a major contributor to plastic pollution, especially in rivers and seas.

They are not easily biodegradable and can persist in the environment for hundreds of years.

Numerous companies and individuals are looking for alternatives to plastic straws as a result of environmental concerns. Straws made of paper, glass, stainless steel, and bamboo are some of these substitutes. Some regions and cities have introduced bans or restrictions on plastic straws to reduce environmental impact. Various countries and states have initiated policies to reduce single-use plastics, including straws.

Some plastic straws may contain harmful chemicals, such as Bisphenol A (BPA), which can leach into beverages. Many consumers have raised concerns about the potential health risks associated with using plastic straws.

Plastic straws have been widely used in the food and beverage industry, especially in fast-food restaurants, cafes, and bars. Many establishments have transitioned to using alternative straw materials to reduce their environmental impact. Some individuals with disabilities rely on plastic straws because they are more flexible and easier to use than alternatives. This has led to discussions about the need for accessible straw options.

Environmental and conservation groups, as well as concerned consumers, have actively campaigned against the use of plastic straws, advocating for more sustainable options. Many advocacy groups and individuals promote the use of reusable straws made from materials like stainless steel, glass, and silicone as a more eco-friendly alternative to disposable plastic straws.

Some manufacturers are working on developing biodegradable or compostable plastic straws as a more sustainable option. It's important to note that the status and perception of plastic straws have evolved

significantly in recent years, with a growing emphasis on reducing their use and finding more environmentally friendly alternatives.

The history of plastic straws reflects the broader evolution of the plastics industry, changes in consumer preferences, and a growing awareness of the environmental impact of single-use plastics. This timeline also demonstrates the continuous initiatives to discourage the use of plastic straws and encourage the use of more easily accessible and sustainable alternatives.

Because they are a more environmentally friendly option than plastic straws, paper straws have become more and more popular in recent years as worries about plastic pollution and environmental sustainability have grown.

Paper and cardboard are the most common biodegradable materials used to make paper straws.. The paper used for these straws is often sourced from sustainable and renewable resources. The construction involves tightly winding layers of paper or cardboard into a cylindrical shape, ensuring durability and resistance to moisture.

One of the key advantages of paper straws is their eco-friendliness. They are biodegradable and compostable, which means they break down naturally and do not contribute to plastic pollution. Paper straws decompose relatively quickly, usually within a few months, and have a significantly lower environmental impact compared to plastic straws.

Paper straws are commonly used in various food and beverage establishments, including restaurants, cafes, bars, and fast-food chains. Paper straws are now widely used by businesses as part of their sustainability initiatives and dedication to minimizing plastic waste..

Paper straws come in various designs, colors, and patterns to cater to different aesthetics and customer preferences. Some paper straws are coated with food-grade wax or a similar substance to make them more water-resistant and durable during use.

Paper straws are known for their biodegradability. When discarded, they will naturally break down into organic matter, returning to the environment. They can also be composted, contributing to the creation of nutrient-rich soil.

While paper straws are an eco-friendly option, they may have limitations when it comes to durability. They can become soft and break down if left in a drink for an extended period, which can be a concern for some users. To address this, some manufacturers have developed more durable paper straw designs and coatings to improve performance.

In response to the environmental impact of plastic straws, some regions and countries have implemented regulations or outright bans on single-use plastic straws. This has contributed to the adoption of paper straws as a more sustainable alternative.

Growing consumer awareness and activism around environmental issues have encouraged the use of paper straws. Many consumers now prefer establishments that offer eco-friendly alternatives.

Paper straws are often considered more expensive than plastic straws, which can be a factor for businesses looking to adopt them. Paper straws have become a symbol of the broader shift toward more sustainable and environmentally responsible choices in the food and beverage industry. Their popularity continues to grow as businesses and individuals seek alternatives to single-use plastics in an effort to reduce plastic waste and protect the environment.

Review of Literature

Moy et. al. (2021) In this study, the environmental effects of paper and bioplastic straws are contrasted and measured. A number of parameters were assessed, including the eutrophication potential (EP), acidification potential (AP), and global warming potential (GWP). The findings indicate that when compared to paper straws, bio-plastic straws, commonly referred to as polylactic acid (PLA) straws, had less of an adverse effect on the environment.

Qiu et. al. (2022) By examining the life cycle, content, recycling rate, degradation rate, usage issues, and application of the materials, he discovered in his research that paper straws are not ecologically friendly, contain hazardous additives, are difficult to recycle and degrade, are expensive to produce, and have a low promotional rate..

Hirschlag (2023) found that the amount of greenhouse gasses released during the lifecycle of paper straws has been estimated to be anywhere from the same as plastic straws to a quarter of the emissions. One set of life cycle assessments performed by researchers in Brazil in 2020 produced similar results, finding paper straws had a higher relative environmental impact than plastic ones.

Hemsley et. al. (2023) demonstrated the importance of plastic straws as an assistive device for the social inclusion of individuals with disabilities. Finding and hearing the opinions of those who use plastic straws but have sensory, intellectual, physical, or multiple disabilities is essential for developing policy in an inclusive society..

According to Jonsson (2021), While choices like paper, wheat, pasta, and rice straws all scored poorly on mouthfeel and flavor like, and there were frequently reported off-flavors in liquids drunk with these straws, cornstarch straws provided the most sensory experience comparable to plastic.

Chitaka (2021) The functionality of the straw was a concern to participants, particularly in the case of paper straws. More specifically, the structural integrity of paper straws when immersed in beverages for an extended period of time was of concern.

A Stanford study found that less than 1% of the issue is actually caused by plastic straws. The danger with banning straws is that it can provide businesses and their patrons a sense of moral justification, making them feel like they've done their part.

Gustafsson (2020) found that although paper straws have become a popular substitute, product qualities such as sogginess are reducing consumer satisfaction. The final recommendation is a fiber-based drinking device with a surface treatment of PHB and encapsulated enzymes. The similar properties of PHB to conventional PP plastic makes it a preferable material to use as a surface treatment. The surface treatment would improve product qualities such as moisture resistance and smooth mouth feeling.

Kim et. al. (2023) found that the surface heterogeneities of paper straws cause hydration-induced swelling even when they are coated with a non-biodegradable plastic covering and encourage fizzing in soft beverages. In this work, poly(butylene succinate) cellulose nanocrystal (PBS/CNC) composites are applied to enhanced paper straws. The straws' smooth, uniform surface coatings prevent the straws from fizzing when used with soft beverages, and their waterproof surfaces make them extremely durable and water-resistant. In the maritime environment and during aerobic composting, all degradable materials efficiently break down.

Methodology

Aim: To conduct a differential analysis between paper straw and plastic straw on accounts of product satisfaction, impact on the environment and overall usefulness.

Research Questions

1. Is there a reduction in pollution as was expected from the supposed upgrade?
2. Is the product proving useful and satisfactory for the people?

Objectives

1. To study the environmental impact of paper straws.
2. To measure the satisfaction of people with the product.

Research Hypothesis:

1. There will be correlation between use of paper straws and decrease in pollution.
2. People feel that the use of paper straws has brought about a change and are satisfied with the product.

Research Design: The design of the study was mixed in nature; using a questionnaire to assess people's perception of the product and make use of secondary data to deduce the overall effectiveness of the endeavor.

Sample: 60 people from the age of 18-25 years were taken and it was a non-probability convenience sample.

Inclusion and Exclusion Criteria: People from the age of 18-25 years were included whereas others were not part of it.

Tools: An online form of the questionnaire was constructed on Google Forms wherein questions containing the usefulness of paper straws and their effect on helping the environment has been calculated.

Research papers and articles were also used to analyze the after-effects of the use of paper straws on the environment.

Procedure

The study was conducted with the purpose of measuring the effectiveness of the use of paper straws over plastic straws. A questionnaire was circulated and research papers were analyzed. The data so obtained was processed and conclusions were drawn.

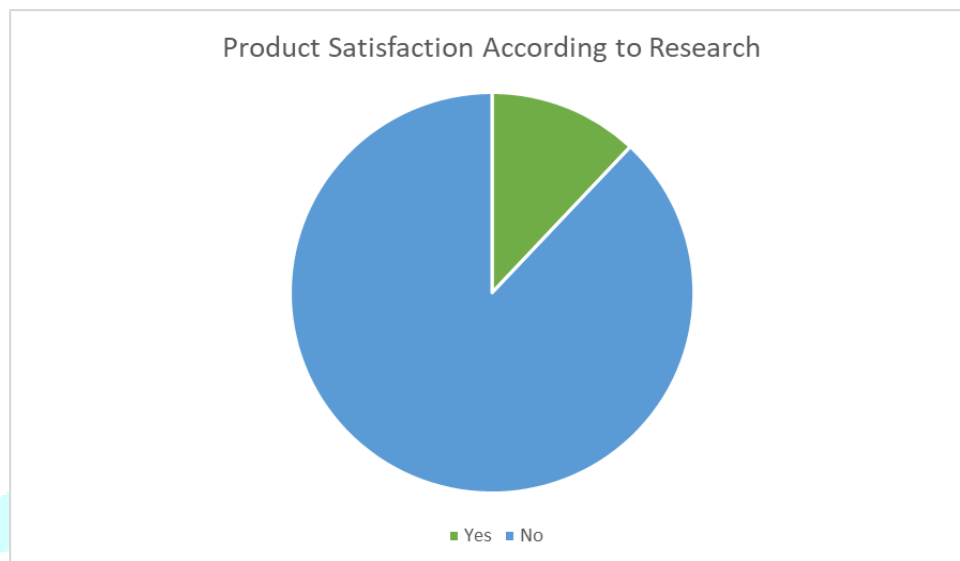
Result Table

Criteria	Product Satisfaction	Product Effectiveness
According to People	Less than 10% people	About 20%
According to Research	About 12-15% people	Less than 1%

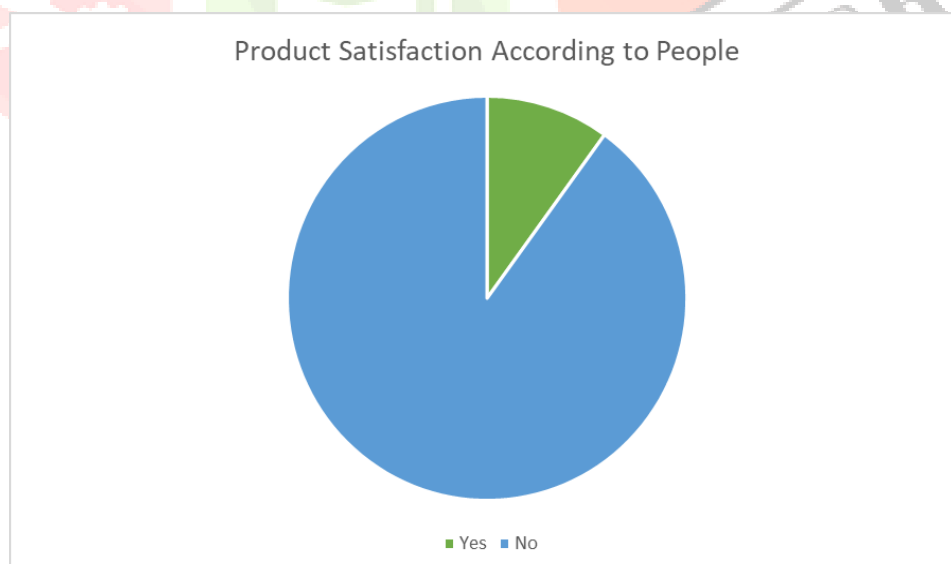
Analysis

The current study began with the endeavor to gauge the effectiveness and product satisfaction of paper straws as a replacement of plastic straws. Paper straws are widely in circulation after the widespread news of the alarming effects of single-use plastics and plastic straws' potential role in it.

There is ample evidence of the harmful effects of plastics on marine and aquatic life but what we lack in research is the actual effectiveness of the alternatives opted. The study began with the collection of data from both primary and secondary sources. A google form was circulated in order to understand people's perception of the product.

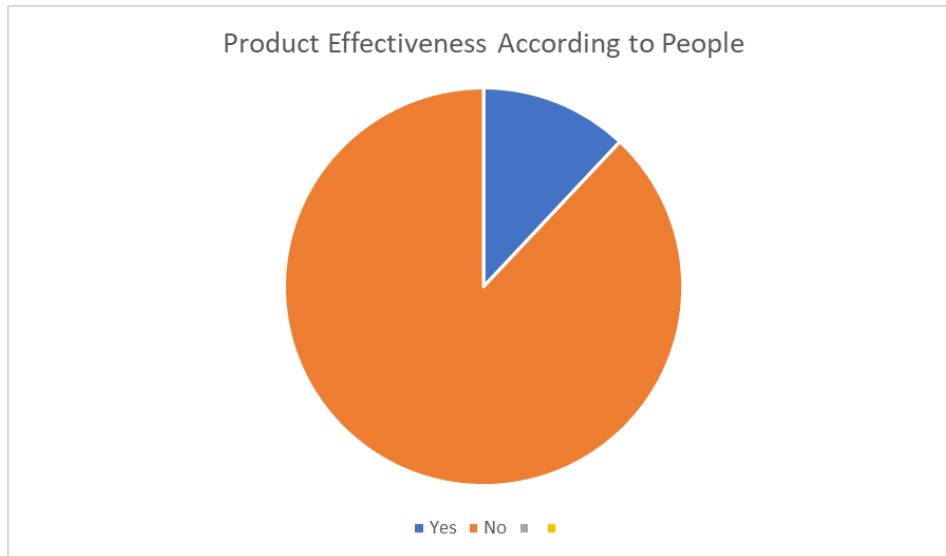


Many articles and research papers were also considered to provide a qualitative factor to the study. The overall findings were surprising; such that the review of literature showed us that plastic straws make for less than 1% of the plastic pollution and the manufacturing process of paper or its decomposition are only a little less harmful and not as effective as one thought they would be.

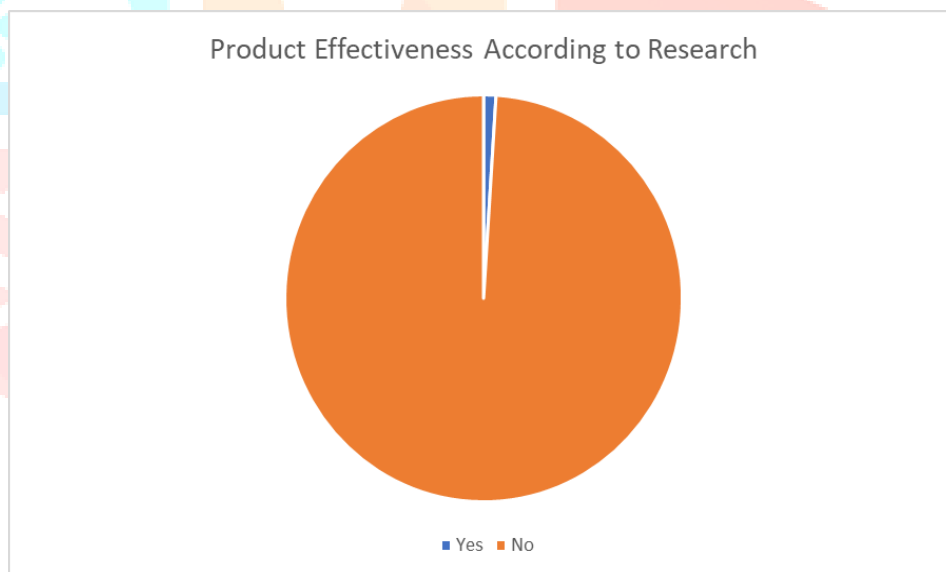


People's perception highlighted that the product is unsatisfactory and they would do away with it, if they had the choice.

The widespread use of paper straws goes in to show how fast and cheap today's supposed environmental awareness is. People did not care to indulge more in research in order to find various healthier alternatives but just jumped at the opportunity to replace plastic.



The endeavor was not ill-placed but considering that paper straws are not really making a drastic change as initially thought, this just shows that industries jumped at the opportunity to seem environment-friendly when in actuality all they did was follow a trend to not run out of business.



The study's findings have shown that paper straws are unsatisfactory on both the major levels and what is required is perhaps even more rigor for the betterment of the fight against environmental hazards.

Limitations

- The sample size taken could have been expanded and it could be designed to include people from more age groups.
- The current research was conducted in an online form which could be considered as a hindrance since it was a self-report measure and people can lie.
- The socio-economic classes were fairly limited to the middle class which could be stretched out to further include all socio-economic strata.

Implications of the Study

The study has implied how people opt for faster options no matter the consequences that it may seem to have. The use of paper straws is just due to ample availability in the present but there is no thought or futuristic design when it comes to straws.

Recommendations

There is much left to be desired after this paper. The paper highlights only the concerns of the urban population and that too mainly the upper middle class young adults. These limitations can be overcome and perhaps more research could be indulged in order to find already existing or new alternatives.

Conclusion

The world is moving at a fast pace and if one does not keep up, they are left behind; a sentiment shared by all food industries who jumped on the trend of doing their part in saving the environment when in actuality plastic straw waste is negligible as compared to other plastic waste and paper straws that seem like god's gift to humanity are not all that good. The decomposition process of paper straws because of its making takes almost a similar amount of time and it still does pollute the environment, not to mention the high cost of manufacturing paper in terms of trees and water. The solution seemed simple enough, yet we are not quite sure if it is right because it did not satisfy on any ground. Further research with environment saving rigor is needed and maybe substances that can imitate plastic and not harm the environment can be discovered.

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