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RESEARCH ARTICLE

A STUDY ON THE FEASIBILITY OF EDIBLE CUTLERY AND CROCKERY IN THE HOSPITALITY SECTOR

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ABSTRACT

Rapid industrialization and urbanization around has led to the enormous amount of solid waste production. Many nations are facing the impact of environmental pollution due to improper waste disposal. Plastic and wood are the two most globally used materials in all walks of life. The use of plastic is a convenient choice but at the same time also hazardous and disastrous to the environment. Cutlery and crockery are one of the most simple and very useful worldwide devices created for consuming food. The disposal of plastic cutlery and crockery is hazardous to the environment. Though the plastic cutlery and crockery are hard to replace taking into account the convenience and costing but at the same time it is necessary to act wisely and sensibly towards sustainable environmental practices and innovate alternative and sustainable ways to plastic cutlery and crockery. One such innovation is the edible cutlery and crockery. Edible cutlery and crockery can turn out to be the future creating a positive impact on the environment and at the same time being nutritious. The concept of edible cutlery and crockery is being developed by many entrepreneurs. Very little is known about these in the hospitality and service sector. The research paper aims to explore the feasibility of edible cutlery and crockery in the hospitality sector.

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INTRODUCTION

The urbanization and modernization of the society has created a new aspect into our lifestyle. The invention of plastic has brought about a new revolution in industrialization and globalization educing time consumption and human energy. The production of plastic has increased from 1.5 million metric ton in 2018 to 400.3 million metric ton in 2022 with the major consumers being the food and hospitality sector. The high amount of production with no sustainable waste management policy has led to some serious negative impact on the environment. The plastic industry is growing at a rate of 30% and creating landfill of wastes which are non-biodegradable. Cutlery refers to any hand held equipment used in preparing, serving and especially eating food in the Western culture and includes items like knives, spoons, forks etc. On the other hand crockery includes items like plates, bowls, saucers, cups etc. on which food is served. Cutlery and crockery are classified into metallic, earthen, plastic or eco-friendly based on the raw materials used. The first recorded use of cutlery was in the 14th and by the 17th century (Tomkin, 2023).

The history of cutlery dates back to the Stone Age with people using sharp stones for carving and cutting. The first metallic cutlery is said to have been developed in ancient Egypt where bronze was used to make knives and forks (Tomkin, 2023). The non-reactivity of silver to most edibles made it a metal of choice. The introduction of stainless steel made cutlery and crockery even sturdier, inexpensive and undemanding (Patil and Sinhal, 2018). Spoon was one of the oldest eating equipment used by human beings and was made using wood, animal bones, sea-shells etc. The first documented evidence of spoon is said to be in 1259 in England. Edible cutlery and crockery are eco-friendly, biodegradable and organic cutlery and crockery using which meals can be served or taken as a meal. Edible cutlery and crockery can be made with a variety of ingredients but some of them provide the quality and trait to the final product (Swaraj. A. et.al.). Edible cutlery and crockery is a new and innovative idea in which the means to eat can be eaten along as well. Though the idea has been existing and has been domesticated for quite some time but it is yet to receive commercial growth on a large scale (Mukherjee. K. & Raju. A., 2023).

The Ingredients used in edible cutleries and crockeries have their own nutritional benefits and enhance the products physiochemical properties when mixed with other ingredients. Edible cutlery and crockery can be an innovative solution to a sustainable environment while at the same time serving the functions as disposable cutlery alongwith being healthy and tasty. Edible cutlery attracts the new customer trends with an appealing appearance. They are manufactured in a variety of colors and flavors thereby driving the current cutlery and crockery market. While the concept of edible cutlery is still in its nascent stage in India, the global edible cutlery market is expected to reach \$56.9 million in 2026 from \$24.8 million in 2018 registering a CAGR of 11.1% from 2018 to 2026 as per the Allied Market Research (Business Today). The Sugu Company of Taiwan claims to have manufactured the first edible Tableware in the year 1986 (Natarajan. N. et.al. 2019).

SCOPE OF THE RESEARCH STUDY

The research study conducted will help in creating awareness about the concept of edible cutlery in the hospitality and food and beverage service sector. Furthermore it will throw light on the on the adoption of edible cutlery and crockery and positive and negative sides of it. It will also help to create alternatives towards a sustainable and eco-friendly environment and tourism.

OBJECTIVES OF THE RESEARCH STUDY

The research study conducted aims to achieve the following objectives:

- To explore and study the concept of edible cutlery and crockery.
- To identify the need of edible cutlery over other cutlery and crockery.
- To explore the feasibility of edible cutlery and crockery in the hospitality sector.

REVIEW OF LITERATURE

Cutlery and crockery has become an important part of our daily routine from morning to night. Various food service outlets choose their cutlery that blend with the general décor of the establishment and the rest of the items on the table. An establishment with one service area generally looks for one pattern or design of cutlery and crockery, but an establishment with multiple service areas looks for different designs. In the food and catering industry today there are unlimited number of cutleries and crockeries to meet specific needs (Cousins. J., Lillicrap. D. Weekes. S., Food and Beverage Service). The concept of edible cutlery is said to have been first put forward in the 2011 by Narayana Peesapathy, a former researcher at the International Crops Research Institute for the Semi-arid Tropic in Hyderabad. Having realized the negative impacts of plastic cutlery, a petroleum by-product on the environment and the threat it possess to human health he invented edible cutlery by experimenting with different flower blends (Das. S., 2020). With the invention of edible cutlery he also tried to address the problem of groundwater shortage. Though edible cutlery is said to be an innovation it was introduced way back in the 1400s. The introduction of bread bowl first took place in 1497in Britain to impress the British Duke.

Since then there have been many edible cutleries in the market but became very popular recently with people talking and focusing more on sustainability (Natarajan *et al.* 2019).

The history of cutlery and crockery dates back to the Stone Age when people used sharpening stones for cutting and carving. The First metal cutlery is said to have been from Ancient Egypt when bronze was used to make knives and forks. Greeks and Romans used metallic cutlery but it was during middle ages that cutlery became more widespread in Europe. By 1000B.C. iron knives were used for eating. Spoon carved from wood shell or bones came to the scene shortly after knives as food began to develop different consistencies. Fork was brought to Europe by Catherine de Medici, wife of King Henry II from a trip to Italy. Initially forks were two pronged but it was in Germany in 1700's that design of forks changed with the addition of extra tines we are familiar today (Chowdhury, G.R. *et al.* 2021). Edible cutlery and crockery was created in Japan for Orto Café by a Japanese designer named Nobuhiko Arikawa of Rice- Design Company that are intended to replace plastic cutlery and crockery. Edible cutlery and crockery are also produced in South Africa by Munch Bowls Private Limited and they produce edible, crisp wheat bowls known as Munch Bowls. The products that are prepared in French patisserie include crackers and cookies to have hors' de oeuvres and desserts (Natarajan *et al.* 2019).

The cutlery and crockery that are used today are made up of metal, wood or plastic that are purified after use and are used repeatedly. Most of the materials used are non-biodegradable. These utensils if not cleaned properly can be the source of pathogens, dust, chemical used for cleaning leading to food contamination (Poonia, A. & Yadav, P., 2017). According to (Fieschi, M. & Preatato, U, 2018) the use of biodegradable and compostable cutlery and crockery combined with organic recycling in QSR, contracts catering and events can help reduce significantly the carbon, water and resource foot printing and is in full line with the principles of circular economy. According to (Patil and Sinhal 2018) the durability, biodegradability, the ease of use, alternative to plastic, wood and metal and the positive environmental and health impacts necessitated the production of edible cutlery and crockery. According to (Krishnapriya, M and Jagdish, S. 2021) the demand for edible cutlery is rising. Materials to be chosen for edible cutlery need to have the lowest ability of absorption. Edible cutlery may also have chances of contamination due to attack by insects or bacteria. The introduction of plastic in the food and beverage service sector made cutleries and crockery cheap, light weight and easy to dispose but with the increased manufacture and usage in many restaurants and food and beverage outlets across the country they are getting collected up at large thereby making the environment toxic and also harming human health (Dordevic *et al.* 2021).

METHODOLOGY

In order to fulfill the purpose of the research both the primary and secondary research methodology was used. The primary research study involved the survey based on a structured questionnaire to understand the awareness and demand of edible cutlery in the food and beverage sector. In the survey method a systematic random sampling technique was used that involved 80 respondents including managers, owners and staffs associated with the food and beverage sector in the various metropolitan cities of India

Secondary data for the purpose of the research was collected with the help websites, journals and articles associated with edible cutlery.

LIMITATIONS OF THE RESEARCH STUDY

The research study is limited to awareness of edible cutleries in the food and beverage sector. Not much has been discussed on the manufacturing and nutritional aspects of edible cutleries. Further the research was limited to only 80 respondents for owners and managers of which few refused to reply. The research study did not take into account the viewpoint of the customers or consumers.

DATA COLLECTION AND ANALYSIS

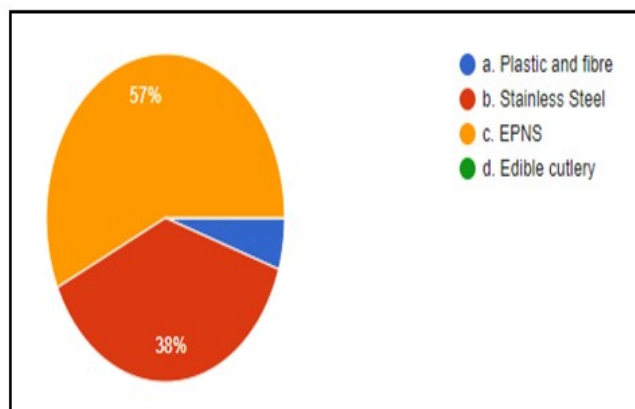
Demographic Profile of the Respondents

Age	Frequency	Percentage (%)
20-30	08	10.53
31-40	51	67.10
41-50	17	22.37
51+	0	0
Total	76	100

Gender	Frequency	Percentage
Male	48	63.16
Female	28	36.84
Others	0	0
Total	76	100

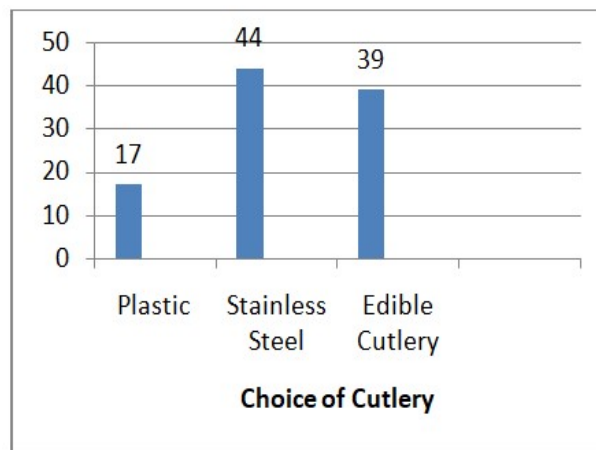
Marital Status	Frequency	Percentage
Married	45	59.2
Unmarried	31	40.8
Total	76	100

The research study undertaken involved a survey from 80 respondents associated with the sector between the age group of 20 and above. In this regard 10.53% of the respondents belonged to the age group of 20-30, 67.10% of respondents were between the age group of 31-40 and 22.37% between 41-50. Majority of the respondents were male with 63.16%. While 59.2% of the respondents were married, 36.84 % were unmarried.

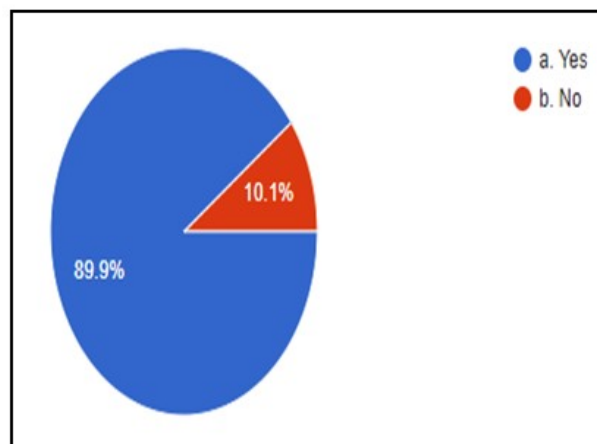


Type of cutlery used in the outlet

As per the survey conducted it was found that majority of the cutleries used the food and beverage service outlets were either of stainless steel or of EPNS. No outlet was found to use edible cutlery due lack of awareness, storage and related issues.



Choice of Cutlery Option for the Restaurant if asked for



Awareness about edible cutlery

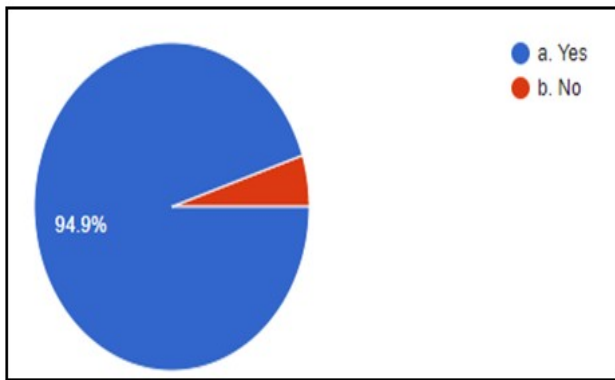
The respondents when asked about choice of edible cutlery and crockery majority of them opted for stainless steel crockery and crockery due to handling convenience and ease of maintenance.

On considering health benefits some even opted for edible cutlery and crockery. But lack of awareness about edible cutlery and crockery proved to be a major barrier in the choice as is evident from the graphs. Very few were of the opinion of using plastic cutlery and crockery owing to factors like standards.

Factors Affecting Purchase of Cutlery

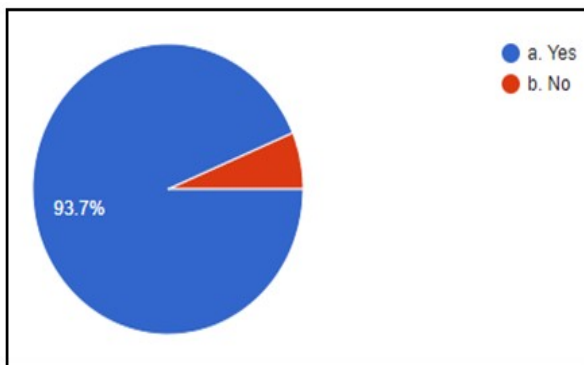
Sl. No	Factor	Frequency	Percentage (%)
01	Quality	13.9	
02	Price	24.1	
03	Reusability	26.6	
04	Color	8.9	
05	Brand	7.5	
06	Environmental Safety	19	

Various factors are associated in the purchase of cutlery and crockery that includes quality, price, color, brand, reusability and environmental safety. In this regard price and reusability were factors of major concern with price being 24.1% and reusability being 26.6%. The third and fourth major factors being environmental friendly and quality respectively.



Whether interested in supporting environmental sustainability and adopting edible cutlery for the restaurant

Majority of the respondents agreed on the fact that environmental sustainability is a major concern today and that government is developing more and more policies in this regard. In order to the concept of environmental sustainability majority agreed to adopting of edible cutlery and crockery if proper guidance on use and storage are formulated.



View on solving food wastage problem and environmental degradation

Problems that can be solved through edible cutlery

Sl. No.	Problems	Frequency (%)
01	Health Issue	11.4
02	Food Wastage	39.2
03	Environmental Degradation	38
04	Higher Investment for Buying Cutlery and Crockery	11.4

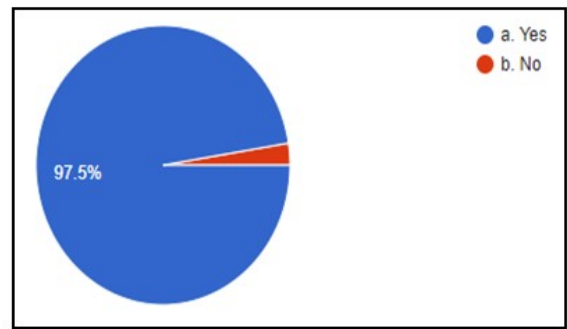
Majority of the respondents barring a few were of the opinion that edible cutlery and crockery can solve problems of food wastage and can contribute to prevention of environmental degradation. It was also observed from the survey that it can solve the problems of health related issues with the use of nutritional ingredients in the making process.

Factors hindering implementation of edible cutlery

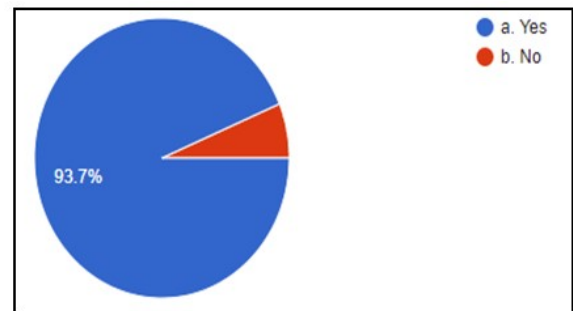
Sl. No.	Factors	Frequency (%)
01	Price	13.9
02	Consumer Awareness	19
03	Cost of Implementation	21.5
04	Perishability	16.5
05	Durability	29.1

Edible cutlery and crockery though not a new concept is an emerging thing that faces various hindrances in the implementation in various food and beverage service outlets due to their durability, absorption power, cost of

implementation, storage and price. Even lack of awareness among consumers is a factor of major concern.



Would you by the edible cutlery if government



Recommendation of Edible Cutlery to colleagues

Incentives are provided?

Majority of the respondents were of the opinion that if government incentives are provided purchase of edible cutlery can be considered and this concept can be recommended to other colleagues.

CONCLUSION

The research study undertaken signifies the importance of edible cutlery and crockery over the traditional plastic cutleries and crockeries that are environmentally challenging. The history of cutlery and crockery from the ancient times with the use of natural elements to the emergence of plastic underlines the need for alternatives that are environmentally biodegradable and safe for consumption. The research focuses on the feasibility of including edible cutlery and crockery in the hospitality sector. It aims to create awareness in the sector on the edible cutlery and crockery. The research study focuses on aspects of cutlery choices and impact edible cutlery and crockery can have in the market. It focused on aspects like government incentives in purchasing and factors hindering in the purchase. Though edible cutlery and crockery is not a new concept but an emerging thing that requires further research study to be done in developing of edible cutlery and crockery and making them long lasting and as well as reducing the absorption power.

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