

A Study on Edible Cutlery: An Alternative for Conventional Ones

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Abstract

Plastic cutlery is a convenient choice, disastrous to the environment as well harmful to health. Being a petroleum by-product, the presence of toxins and carcinogens that can be easily absorbed into human body. Disposal of plastic cutlery has become hazardous for environment as toxins and carcinogens can leech into food through the natural ecosystem as plastics are occupying a lot of space and clog the landfills annually.

The recent ban on plastics and due to the threat to environment seeded the idea of biodegradable cutlery. Although India has seen only one major entrepreneur of edible cutlery but with time and demand many other suppliers will emerge.

This study enable us to realize that consumers are well aware of the ill effects of the use plastic disposable cutlery. They prefer to use the conventional stainless steel cutlery as compared to the other varieties available. They would also like to see the increase in the supply of edible cutlery as their prices are currently high and availability is limited.

Keywords: Cutlery, Edible Cutlery, Disposable

INTRODUCTION

Cutlery has been one of the most simple but very useful devices that has been created and used world over for consuming food. Who exactly invented these is still unknown. It is believed that spoons are one of the oldest eating equipment that have been utilised by human beings and were made with natural elements like wood, animal bones, seashells. The first documented evidence of spoons was way back in the year 1259 in England.

Spoons at that time were not merely used for eating but also used in ceremonies to demonstrate wealth and power. By the turn of the 18th century forks and knives were also introduced for eating food. Silver was the most preferred metal for cutlery as it was non-reactive to most of the foods until the introduction of stainless steel. Stainless steel became the preferred metal for most of the cutlery as it was easy to maintain, non-reactive and sturdy. With the introduction of plastics into the market, it brought down the prices of cutlery drastically and at the same time made its availability very easy. A lot of varieties and sizes were introduced for people to choose from, like cups, plates, spoons, forks, knives, etc. Today the cost of the stainless steel cutlery is much higher than plastic or edible.

The plastic industry is worth 3000-4000 crores in India itself and as per the Central pollution control board in 2016 India produced more than 15000 tons of plastic waste everyday of which around 9000 terms are recycled and the remaining is not collected or remains littered. This increased to around 25000 tons in 2017. The use of this plastics and the problem of disposing them is a way big problem that is being observed in our country today.

Some entrepreneurs are trying to bring in solution for plastic disposable cutlery by introducing edible cutlery. After a lot of trials one such entrepreneur came up with complete natural edible cutlery which caught up not only in India but throughout the world. It is completely biodegradable and does not require any special conditions to do so. Moreover, it can be consumed at the end the meal. It can be used to eat all types of food whether it is hot or cold, solid or liquid; one can have a hot soup with it at the same time cold desserts as well. With the recent Ban of plastic products in many states of India

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people are looking out for substitute of plastic disposable cutlery full stop many entrepreneurs are trying to foray into this particular business of developing cutlery that is eco-friendly. This could possibly lead to replacing plastic cutlery but not the conventional metal ones.

DEFINITION

Cutlery

- Cutlery includes any hand implement used in preparing, serving, and especially eating food in Western culture (<https://en.wikipedia.org>).
- Knives, forks and spoons used for eating food (<https://dictionary.cambridge.org>).

Disposable

- Designed for or capable of being thrown away after being used or used up: disposable plastic spoons; a disposable cigarette lighter (<http://www.dictionary.com>).
- A disposable product is intended to be thrown away after use (<https://dictionary.cambridge.org>).

REVIEW OF LITERATURE

J Gasperi, R Dris, T Bonin, V Rocher (2014) in their research paper “Assessment of floating plastic debris in surface water along the Seine River”. His study is intended to examine the quality and quantity of fluid floating plastic debris in river Seine. A significant proportion consisted of food wrappers containers plastic cutlery probably originating from voluntary or involuntary dumping. Discharge and surface runoff the plastic tables in river represented between 0 to 0.8 % and 5. 1 % of total debris is collected by weight.

KL Thyberg, DJ Tonjes (2014) in their research paper “Degradable Plastics and their Potential to Affect Solid Waste Systems” study say, plastic waste forms a substantial part of municipal solid waste and has caused environmental concerns due to persistent litter. Plastic complicates waste management through poor recycling contamination. Degradable plastic aim to end of life of plastic product and reduce environment impact. In this paper they have discussed how these materials perform

in different aspect of solid waste program as recycling composting incineration landfills ASN to reduce little problem.

NM dana Gopal, P Phebe, EVS Kumar in their research paper “Impact Of Plastic Leading Environmental Pollution” (2014) state that The environmental pollution is defined as the undesirable changes in physical chemical and biological characteristics of our air land and water as a result of overpopulation rapid industrialisation and other human activities like agriculture and deforestation acceptor are loaded with diverse pollutants. Plastic is now regular material which is been used on daily basis in packaging industry, construction industry, disposable cutlery or storage. The increase used in production of plastic in developing emerging countries is a very much for concern as their waste management infrastructure may not be developed. Plastic pollution is defined as the accumulation of the different types of plastic material on land as well as on water bodies. As a community it used on a large scale it consists of a synthetic polymer that consists petrochemicals which degrade in around 500 to 1000 years all we may not know the actual degradation time. During manufacturing many hazardous chemical are emitted which can lead to disease to human and animal as well.

Brownlee, Chris and Maria (2013) in their research, “Life cycle assessment-expand where biodegradable cutlery” emphasize that the life cycle assessment on biodegradable cutlery is done by Brownlee analyser this study was sponsored by us UPA seats which aims to address in sustainability challenges on which type of disposable country is the most sustainable choice . a life cycle assessment was performed on disposable and compose table wooden cutlery, the goal of this is study to help determine cutlery consumption habits and impact when purchasing disposable cutlery. A assessment is presented in the comparison to plastic cutlery in terms of greenhouse gas emission and economic cost. The study will benefit in determining the environmental impact of their products and areas of improvement

Achyut K. Pandaab R. K. Singha1, D. K. Mishratopic (2010) in their research paper “Thermolysis of waste plastics to liquid fuel: A suitable method for plastic waste management and manufacture of value added products - A world prospective” point out that the present rate of economic growth is unsustainable without Fossil energy

like crude oil energy natural gas or coal humankind has to rely on alternative renewable energy sources like Biomass hydropower geothermal energy wind energy solar energy nuclear energy etc., as well suitable waste management strategies are the important aspect of development which is related to the good use increased in generate waste .plastic has been the material which has wide range due to acidity and relatively but creating a serious environmental problem. The disposal of plastic is increasingly being cost effective and there is demand for disposal and landfilling. The substitute, the non-biodegradable plastic in application has been in research among the alternative available resources, reduction, reuse, recycling and recovery of the inherent energy value through waste to energy insulation and process fuel application which will reduce waist and conserve natural resources

Fransisco Razza, maurizio fleschi, Francesco Degli Innocent (2009) in their research “compostable cutlery and waste management: An LCA approach” says about the use of disposable cutlery in fast food restaurants and canteens in the current management scenario generate mixed heterogeneous waste. This waste is not recyclable and is disposed without any energy recovery. It says that using by biodegradable and compostable plastic cutlery and alternative management scenario is possible. The resulting mixed waste can be recycled through organic recovery.

M Kolybaba, LG Tabil, S Panigrahi (2006) in their research paper “Biodegradable polymers: past, present, and future” says that by biodegradable Polymers material are of interest as this is the backbone of plastic material. Many researchers are investing time into modifying this material to make it more user friendly on a number of biological material may be incorporated such as starch and fibre extracted from various type of plants which will have a positive impact or effect on both environment and economy

Author- Catia Bastioli (2005) in his book “Biodegradable material present situation and future” says biodegradable Polymers constitute from loosely define family of polymers which are designed to degree grade through the action of living organisms. The main driving force behind in this technology is the solid waste problem regarding decreasing availability of landfills little problem and the most important pollution by non-biodegradable plastics. Thermoplastic starch based Polymers and aliphatic

polyesters are two classes of biodegradable material with the greatest near term potentials. This paper reviews a great variety of properties structure and biodegradation behaviour of thermoplastic starch.

M. Flieger M. KantorováA. Prell T. Řezanka J. Votruba (2003) in there research paper “Biodegradable plastics from Renewable resources Authors and affiliations” says that plastic waste disposal is an eco-technological problem and to solve this problem is a development of biodegradable plastic. The review summarise values, biodegradable grade ability, commercial reliability and production from renewable resources for example material can be polyglycolic acid poly lactic acid polycaprolactone

Richard A. Gross, Bhanu Kalra (2002) in their research “Biodegradable Polymers for the Environment” has studied on biodegradable Polymers are designed to degrade upon disposable by the action of living organisms. The need to create alternative biodegradable water soluble Polymers are extremely important.

NC Billingham, DM Wiles, B E Cermak (2000) in their research “Controlled lifetime environmental degradable plastic based on conventional polymer” say that environmentally degradable plastic product must satisfy at least 2 requirements soil burial or outdoor exposure. It must lose its Mechanical properties rapidly enough to disappear visually. The material should be susceptible enough to ensure its complete conversion to Biomass without any toxic products. One major approach to developing biodegradable packaging material has been the use of intrinsically biodegradable polymers. For example polyhydroxy butyrate poly carbolactone PCL poly lactic acid these are biodegradable so that the biostimulation is a synergetic interaction between hydrolysis and biodegradation.

TN Malafi, MA Devine, LL Leshner in their Research paper (1994) “A user evaluation of biodegradable cutlery Journal of environmental polymer” Is a study on the evaluating the acceptance and performance of disposable cutlery made from starch based biodegradable polystyrene cutlery. 243 sailors on board three US Navy vessels at the launch using either biodegradable cutlery made with raisins or polystyrene cutlery the cutlery was rated on sensory and performance dimension as well overall acceptability and the resulted that the Sailor rated both the biodegradable and polyester and utensils are easy to hold.

OBJECTIVES OF THE STUDY

- To explore the concept of edible cutlery.
- To identify determining factors of demand for edible cutlery.
- To compare the characteristics of conventional, Metallic, Plastic disposables and edible cutlery.
- To give the recommendations on development of cutlery for better sustainability.

RESEARCH METHODOLOGY

Data Collection: The primary data required for the research was collected using the following techniques:

Personal interviews: The researcher conducted personal interview with respondents. The respondents were provided with samples of edible cutlery before obtaining their responses.

Questionnaire: A questionnaire bearing straight forward and relevant questions was drafted and handed over to the sample to obtain their responses.

Sample Technique: This study was conducted with responses of more than 100 respondents between the age group of above 25 to 50 years.

All the samples were selected randomly from the various areas of Pune city.

Apart from the above mentioned tools the relevant secondary data for the research was collected from journals, books and internet.

OBSERVATIONS AND DISCUSSIONS

Factors Responsible for Demand of Edible Cutlery

Since the factor of reducing the use of plastics has picked up in the last few years and recently the ban imposed by Maharashtra state government on use and manufacture of plastics are a couple of the major factors that have set people and manufacturers of disposable cutlery thinking

on what could be the replacement for disposable plastic cutlery.

It is observed that the consumers are aware of edible cutlery being eco-friendly and also that they are biodegradable hence could bring a change by not using disposable plastic cutlery in day to day life. Many of the consumers feel that they would like to buy edible cutlery but not on regular basis but for trying out something new or fancy that is available in the market. It is observed that edible cutlery could become an option or an alternative for disposable cutlery for which a lot of manufacturers need to start mass production in order to reduce the prices and making availability of such edible cutlery easy for the consumers. The consumers also feel that edible cutlery cannot be an alternative for that metal cutlery that is being used currently in all the households owing to the life and durability of metal cutlery. Consumers still have a doubt in their mind regarding the ease in handling and using edible cutlery as it is new in market and most people not using it on regular basis. Although edible cutlery that is available currently is durable to consume any type of food like hot soups to bhel puri, salads to ice-cream, it does not wear down easily. They also believe that it is a matter of time that the doubt of durability may also minimize.

Determinants Considered Before Selecting Cutlery

- *Aesthetics and Variety*

Plastic cutlery may be available in various colours and sizes but they are not available in variety of designs where as edible cutlery is very simple and plain structure without much of designs but they do have more of a rustic look. The consumers feel that metal cutlery is available in more variety in the form shapes, sizes and wonderful designs in the market. They also mention that different metals are also used to add to the aesthetics of this type of cutlery.

- *Cost and Life*

Plastic cutlery is available at a very low price hence people prefer using it for most of the occasions as they need not collect it, wash it and store it again.

They just need to put it into the trash. This type of plastic waste gets accumulated and piles up into landfills which will take hundreds of years to decompose. Edible cutlery on the other hand that is slightly costlier and it will take some time for people to get used to edible spoons. Being biodegradable in nature edible cutlery if thrown away gets completely decomposed in a very short time. This edible cutlery also provides nutrition and can be eaten as a snack as it also comes in different flavours. Metal cutlery owing to its use life span is preferred by people. Although their cost is on the higher side than other cutleries, still consumers buy and utilise them in their day to day lives full

- *Durability and Availability*

Metal cutlery is a highly durable and is also available easily in the market. Plastic disposable cutlery is readily available at every nook and corner shop but durability is a question. May be a couple of varieties do provide some sturdiness but most varieties are not. Consumers still have their own limitations about the durability of edible cutlery and they very clearly indicate of its limited availability and hence cannot buy it very often.

After the recent ban of plastics mentioned earlier it is found that people are trying to switch over to metal cutlery and looking out for other options. But before this ban, use of disposable plastic cutlery was rampant in many sectors of the food industry. With the introduction of edible cutlery people have started to compare and feel that edible cutlery is much more costly as compared to disposable plastic cutlery. Hence they used to prefer to buy disposable plastic cutlery as against edible cutlery.

In addition the consumers felt that the texture of edible cutlery being a little on the harder side might make it difficult for some people to eat or consume this cutlery. The consumers also emphasised that due to the availability of edible cutlery being restricted they are not able to switch over to edible cutlery easily. If given a chance consumers are ready or willing to further recommend others the use of edible cutlery to other people and also bringing awareness of the harmful effects of plastic cutlery.

FINDINGS

Analysis of data is done from results obtained from more than 100 respondents from various areas of Pune city. The result obtained from this is represented graphically.

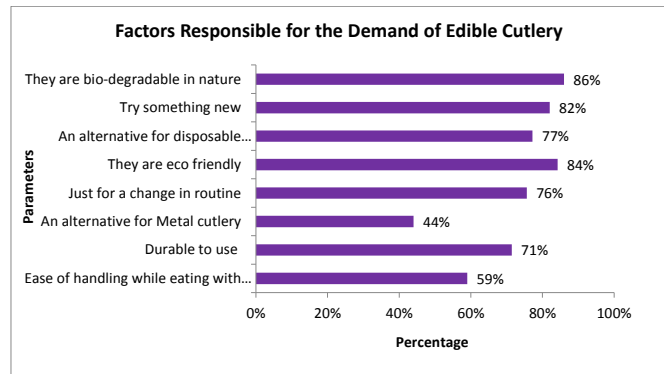


Fig. 1

Fig. 1 shows that consumers are aware that edible cutlery are bio-degradable and eco friendly. It further determines that consumers are still not comfortable to eat with edible cutlery and cannot be an alternative for metal cutlery.

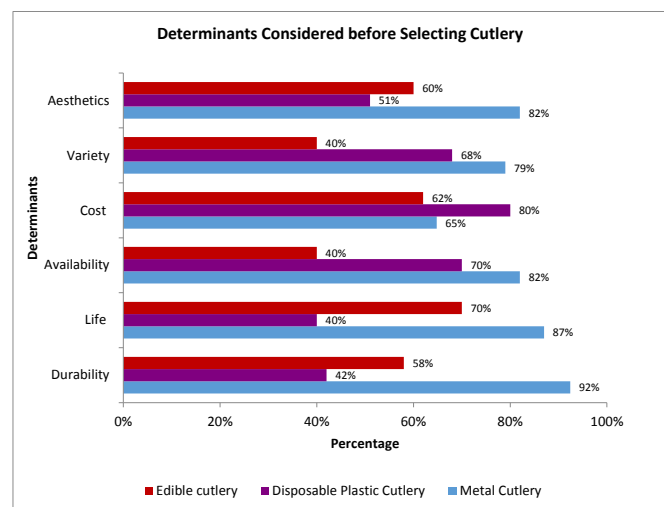


Fig. 2

Fig. 2 indicates metal cutlery is favoured by most of the consumers. Disposable plastic cutlery is preferred due to its low cost and ease of availability whereas edible cutlery has less variety and not available easily.

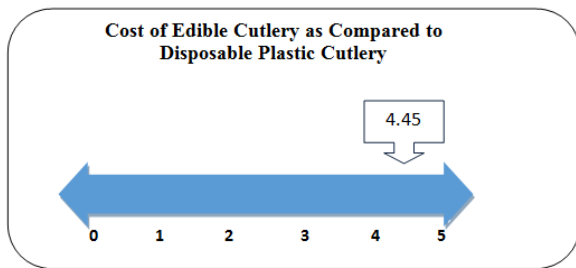


Fig. 3

Fig. 3 indicates consumers still prefer to buy disposable plastic cutlery owing to its low cost.

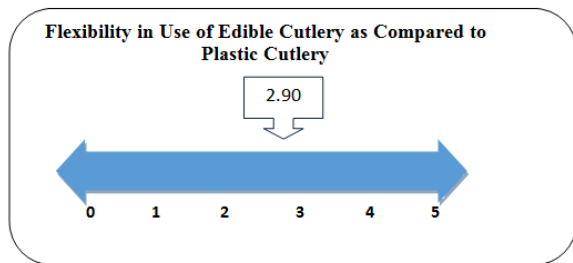


Fig. 4

Fig. 4 indicates that the consumers feel that the flexibility in use of edible cutlery is less

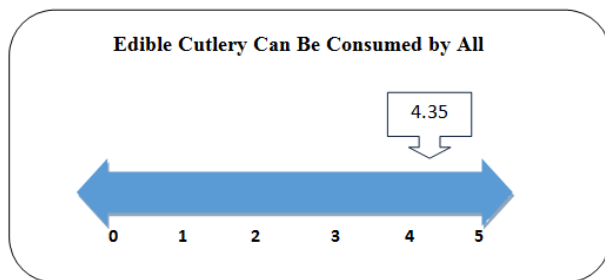


Fig. 5

Fig. 5 indicates that most consumers feel that the edible cutlery can be consumed by all.

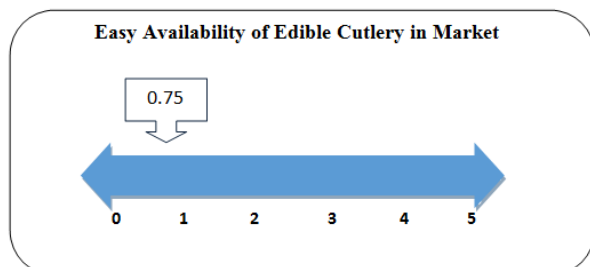


Fig. 6

Fig. 6 indicates that consumers are not able to procure edible cutlery in the market.

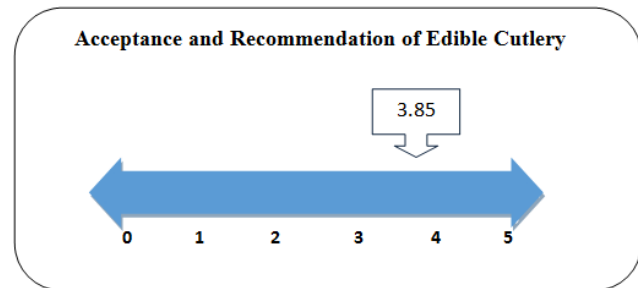


Fig. 7

Fig. 7 indicates that consumers are willing to recommend the use of edible cutlery to more people.

RECOMMENDATIONS AND SUGGESTION

- It is suggested that the more manufactures can foray into the manufacture of edible cutlery to enable reduce the prices and easy availability in the market.
- The consumers and catering establishments should reduce the use of plastic disposable cutlery and try to adopt edible cutlery.
- The study is conducted in the current scenario and sample presented; the opinions, perception and expectations of the respondents may differ with time and does not differentiate respondents on basis of their demographic factors which may have an influence of their perception thereby identifying scope for further research.

CONCLUSION

The results presented here reveal a simple but essential fact that the popularity of metal cutlery is still on a high note and respondents find the use of metal cutlery the best in their day to day life. Respondents also feel that metal cutlery is more durable and easy to maintain. Plastic disposable cutlery being economical and easily available, are used almost for every occasion and function. They use of edible cutlery is very rare as its availability in the local market is unknown.

Respondents are aware of the fact that the plastic disposable cutlery is not bio-degradable and is adding pressure on the ecosystem of nature. But owing to its convenience and price they prefer to buy it. They are also

aware of the availability of edible cutlery but it is restricted to buying it online and from a few enthusiasts who are trying their own methods for replacing disposable plastic cutlery. Most respondents feel that it can be consumed by all and they wouldn't mind spreading the message of using disposable cutlery.

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